Coal Age

MAY, 1953

A McGRAW-HILL PUBLICATION — PRICE 50c

Low-Cost Deep Mines

Enoco's 20 steps to greater mining efficiency (p 92). How Kaiser rebuilt Sunnyside to boost mining results (p 114).

Selenium Rectifiers

How Crucible Steel operates new-type high-capacity unit for safer, better power conversion underground. p 100

COAL SHOW PREVIEW... p 122

Efficiency—Machine-Made... p 85

put your MEN and SUPPLIES on wheels

MINE CARS do double-duty. They haul coal out of the mine... take men, timber and supplies back in. No other transportation system 'can make this statement'. But mine cars have other advantages!

Foremost is confidence! You *know* when you install a mine car transportation system that you'll never have a transportation shutdown —because when a car occasionally needs attention, it's shunted to a siding. The rest of the trip continues on its profit-making way.

If you have a new mine... or mechanizing your present one— why not call your A.C.F. Representative. He has lots of interesting data you might profitably use. American Car & Foundry Company, New York • Chicago • St. Louis Cleveland • Philadelphia • Washington • San Francisco Berwick, Pa. • Huntington, W. Va.

Pay us a visit at the
CLEVELAND COAL SHOW
May 11-14
BOOTH NO. 1523.

a.c.f. **MINE CARS**
for Constant Haulage

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

Why B. F. Goodrich cord belts reduce "spill," last longer

EXCESSIVE "spill" and costly belt damage are both caused by conveyor belts that don't trough properly—belts that are too stiff to conform to the idlers, and so run off center, wear along the edges.

In the B. F. Goodrich *cord* belt these problems have been eliminated. There's a ply of parallel cords, running lengthwise, built into both the top and bottom of the belt. Each cord is completely surrounded by rubber—no cross threads tie them together. There being no crossweave in the cord plies, the cord belt is more flexible, and so troughs and tracks perfectly whether empty, lightly or fully loaded. Spillage is reduced, belt keeps centered on idlers, requires less maintenance.

The B. F. Goodrich cord belt shown here had been in service 10 years when the picture was taken, and was in such good condition, engineers estimated it would last another five to eight years. It handles 350 tons an hour of run-of-mine coal weighing 50 lbs. per cubic foot. Troughing is natural; there's been no maintenance due to edge wear.

Natural troughing is just one of the reasons Caricoal cord belts last longer, serve better. Other construction features provide high impact resistance and double protection against mildew. Let a BFG distributor show you how these longer-lasting conveyor belts can cut your coal handling costs, or send for the free booklet describing the B. F. Goodrich Caricoal line of conveyor belts.

Caricoal Conveyor Belts
BY
B.F.Goodrich

The B. F. Goodrich Company
Dept. M-30, Akron, Ohio
Without cost or obligation, please
☐ send me booklet about B. F. Goodrich conveyor belts.
☐ have a BFG distributor see me.

Name_____
Company_____
Address_____
City_____ Zone_____
State_____

THERE'S A *Better* WAY

The little old buggy with the fringe on top got there and back, safely, when time and rutted roads didn't matter. But today how much smoother and faster we travel, with the opportunity to see the wonders of this world (or the next) magnificently increased. Yes, in the matter of travel, we do things better today.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA, PA.

TO DO IT TODAY!

AND THAT GOES FOR *lubrication,* TOO

YOU DO IT
best
WITH

Hulburt *Quality* GREASE

Some folks still look back fondly to the past—but you'd scoff at the very idea of horse-and-buggy-era lubrication for your coal mine machinery! The surest way to be SURE you have the one right lubricant, the only modern specialized Quality Grease made specially to lick this one tough job—is to use HULBURT GREASE. Yes, coal mine machines using Hulburt Grease DO do their work better today, at lower costs for operation and maintenance.

See this BIRD at the COAL SHOW

— it's a full size (40″ x 60″) Bird Polisher, and in two minutes we can show you how it takes the minus 325 mesh, high ash particles right out of your coal cleaning water, polishing it up so the water stays in closed circuit — never has to go to a sludge pond or pollute a stream.

Hooked up with a simple flocculation system, the Bird takes out those slimy fines and delivers them continuously to a refuse belt.

Get the interesting story at the Show, Booth 228, or write

BIRD MACHINE COMPANY
SOUTH WALPOLE, MASSACHUSETTS

Builders of the well-known BIRD COAL FILTER for dewatering fine coal.

Coal Age

MAY • 1953

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How coal's billion-dollar expenditure in past 10 yr has cut cost $1 per ton.

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COAL-SHOW REPORT

THE JUNE ISSUE of *Coal Age*, in addition to a full list of articles on various phases of deep and strip mining, will bring you a special report on the 1953 Mining Congress Coal Show at Cleveland. All the papers given at the technical sessions will be digested for easy checking, and a separate report will bring you the complete details on the equipment and materials featured in the exhibits. If you didn't make it or if you got there but had to miss something, you will find it in the June Coal Show report.

ALSO COMING IN COAL AGE

The Southwest will figure prominently in the line-up of future *Coal Age* articles, along with other areas in *Coal Age's* Nation-wide coverage of mining developments. Articles on up-to-the-minute developments in the Southwest include the following:

Stripping at the new Power mine of the Power Coal Co., in Missouri, where high-capacity modern equipment recovers a 20-in seam. A mine-designed and built horizontal overburden drill provides quick vertical adjustment and high drilling speed.

Deep-mining another thin seam at Henryetta, Okla., is the subject of a second southwestern feature. Seam thickness is 36 in and mobile loaders discharging to shuttle cars produce the coal from faces 315 ft long at the Blackstone drift mine of the Ben Hur Coal Co.

And from the anthracite industry comes a feature on one of the necessary by-products of mining: refuse handling and disposal at the Coaldale colliery of the Lehigh Navigation Coal Co., Inc. The problem at Coaldale was not only getting rid of mine rock but also keeping fine material from building up in mine cars and reducing their capacity. The answer was an automatic car-washing station and a new system of getting mine rock to the trucks.

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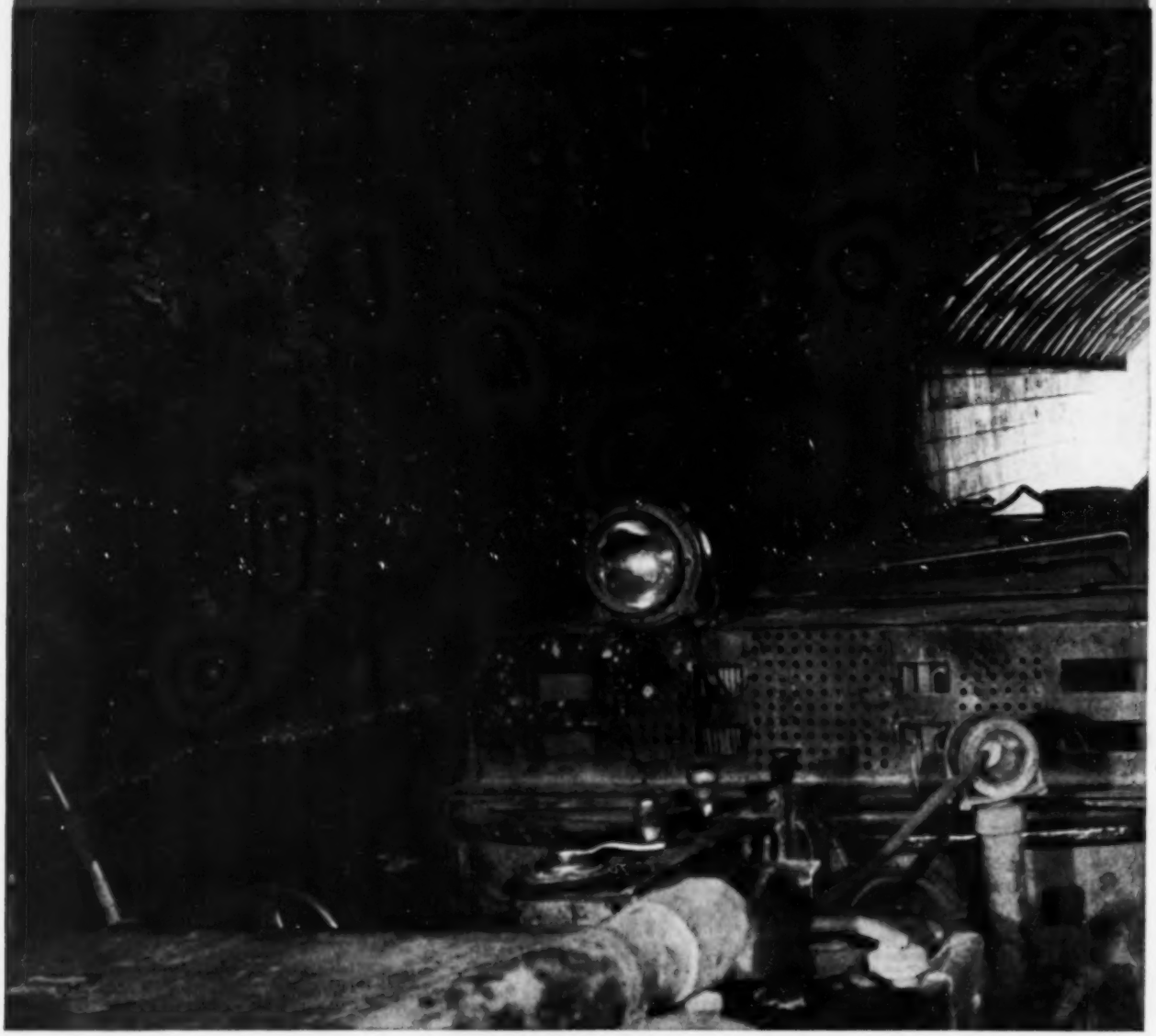
How to EXTEND THE your most expensive



TUNE IN:
Tuesday nights
On television —
the TEXACO STAR THEATER
starring MILTON BERLE.

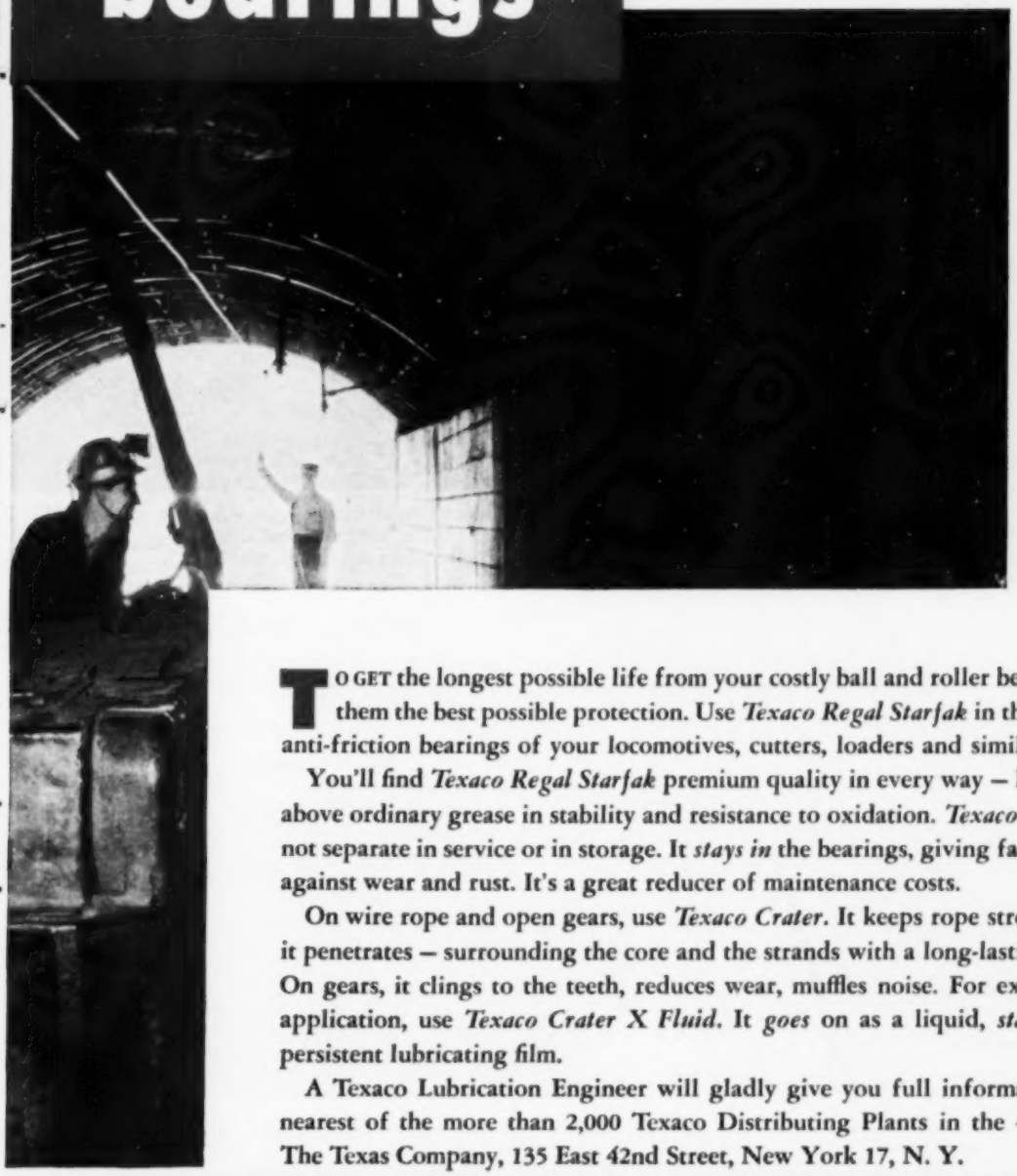
See newspaper for
time and station.

TEXACO

TEXACO

SAY HELLO TO TEXACO
BOOTH 1801 — COAL SHOW
Cleveland, May 11-14

LIFE of bearings



TO GET the longest possible life from your costly ball and roller bearings, simply give them the best possible protection. Use *Texaco Regal Starfak* in the grease-lubricated anti-friction bearings of your locomotives, cutters, loaders and similar equipment.

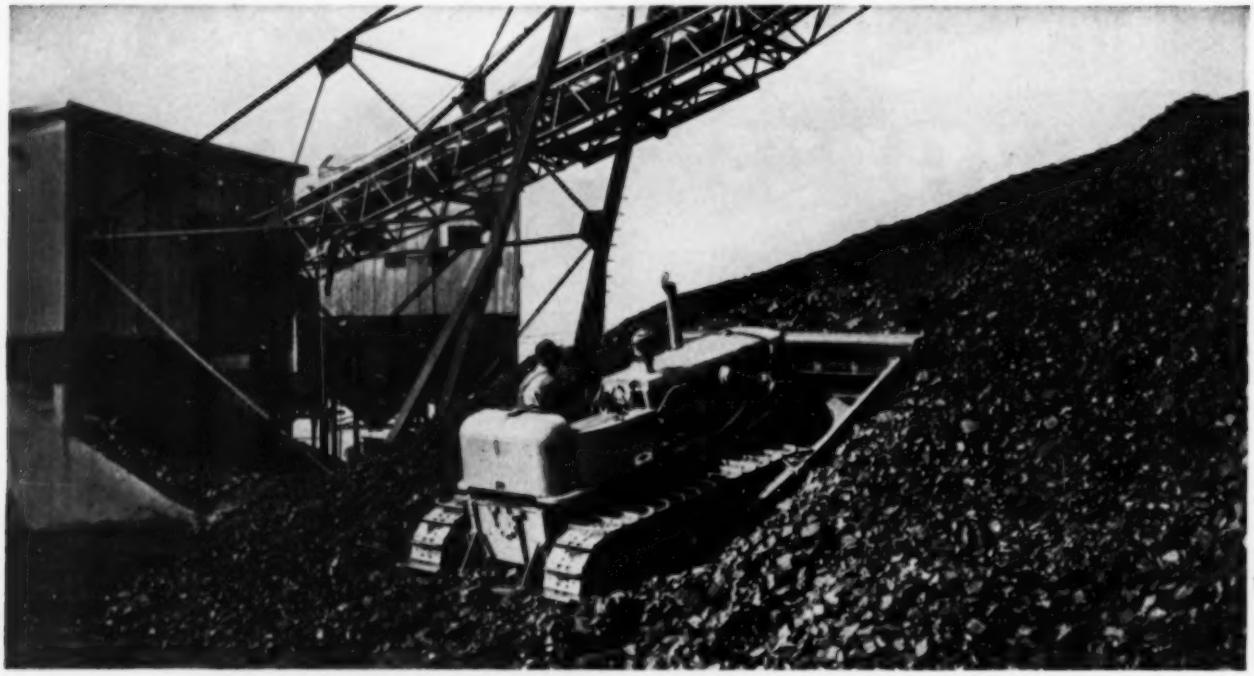
You'll find *Texaco Regal Starfak* premium quality in every way — head and shoulders above ordinary grease in stability and resistance to oxidation. *Texaco Regal Starfak* will not separate in service or in storage. It *stays in* the bearings, giving far longer protection against wear and rust. It's a great reducer of maintenance costs.

On wire rope and open gears, use *Texaco Crater*. It keeps rope strong longer because it penetrates — surrounding the core and the strands with a long-lasting protective film. On gears, it clings to the teeth, reduces wear, muffles noise. For extra convenience in application, use *Texaco Crater X Fluid*. It *goes* on as a liquid, *stays* on as a tough, persistent lubricating film.

A Texaco Lubrication Engineer will gladly give you full information. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICANTS for the Coal Mining Industry

NEW TRENDS IN MINING MECHANIZATION



Maintains Coal Stockpiles At Mine. HD-9 Tractor also handles stripping, cuts drainage ditches, feeds and cleans up around shovels, tows equipment. Wide range of bulldozers — straight or angled, cable or hydraulic -- assures the right combination for every job. Each is designed to retain tractor balance and accessibility.

Loads Hauling Units. HD-20G Tractor shovel loads coal, overburden, other bulk materials — four cubic yards at a scoop. With 175 net engine horsepower, it has the excavating ability to load coal right out of some seams without blasting.

Builds and maintains haul roads. AD-40 Motor Grader levels pit bottoms . . . digs and grades for drainage . . . scarifies . . . prepares dragline sites. Gasoline-powered Model D Grader also available. Handles routine road maintenance — light construction, etc.

TODAY'S demands on mining production require the selection of equipment of the broadest versatility. Allis-Chalmers offers a complete range of material moving and handling equipment — including four sizes of diesel crawler tractors, motor graders, pull scrapers, high-speed Motor Scrapers and Motor Wagons — designed to fit your particular mining applications and to deliver the highest possible output.

Here are some on-the-job views with a few of the many ways in which these modern machines are speeding production and lowering costs.

Strips overburden. 13-yard heaped capacity TS-200 Motor Scraper also loads, hauls material from open pit . . . clears and levels for camp sites and drill setups . . . levels and grades building sites . . . hauls in supplies. Larger 18-yard heaped capacity TS-300 also available.

Hauls rock overburden. TR-200 Motor Wagon body is interchangeable with TS-200 Motor Scraper body. Unit travels fast "off-road" with capacity loads . . . dumps clean every time with 18-ton, hydraulic-controlled rear-dump body. Sides channel-ribbed for rigidity.

Tractor-Scraper Team. HD-20 Tractor with pull-type scraper loads and hauls coal — handles large-scale stripping jobs. Exclusive Allis-Chalmers hydraulic torque converter on HD-20 gives higher output, less upkeep on pulling, pushing and dozing work.

Complete line of pull-type scrapers available, from 2-yard to 18-yard sizes.

Your Allis-Chalmers dealer will be glad to analyze your equipment needs and help you select the right machines for your jobs. See or phone him soon to watch these machines in action.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

See JEFFREY AT THE COAL SHOW

Usual area on the lower Lakeside level

SHUTTLE CARS

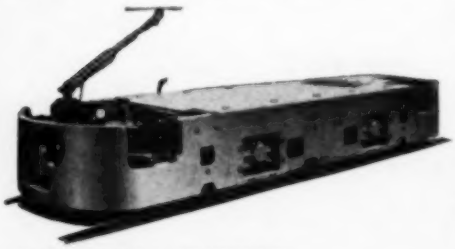
Cable reel types in various heights and with elevating discharge. Operator's deck either left or right side. Three models will be on display.

BELT CONVEYORS

For intermediate or main line haulage. Extensions easily and quickly made to keep up with room development. Also chain conveyors in various types and sizes.

LOCOMOTIVES

On display will be this 13-ton Main Line Locomotive with semi-magnetic contactor control, air brakes and sanders. Timken roller bearing journals and axles.



UNIVERSAL CUTTERS

Cutter bar can be rotated and positioned to cut anywhere in the seam — top or bottom cutting and shearing. Will make 30′ horizontal cut. Also SHORTWALL coal cutters.

COLMOL Continuous Mining Machine

Various models for mining and loading without use of explosives. Mines an entire room 9′ 6″ wide to full height of seam. See this unit during the Show.

ROOF DRILLING MACHINES

The RDR features a specially-designed, hydraulically-operated Arm mounted on either side of self-propelled, rubber-tired truck. Includes impact wrench for anchoring and tightening bolts.

DRILLING MACHINES

The Jeffrey FHR for off-track mining features hydraulically-controlled Arm to permit drilling holes at proper place to required depth.

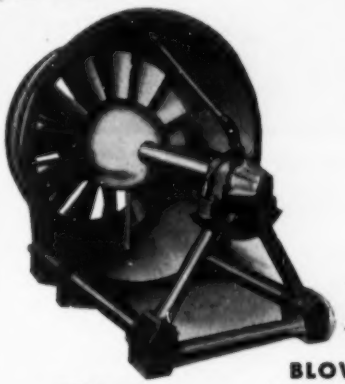
For the past 75 years, Jeffrey has kept pace with the steady growth of mechanization in coal mining. When you attend the May Exposition you will be impressed by the modern equipment Jeffrey has on display.

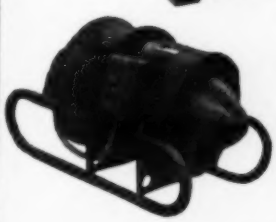
Today, Jeffrey offers a well-rounded line of coal mine machinery covering all phases of operation — drilling, cutting, loading, conveying, hauling, gathering, ventilating as well as preparation equipment for the top-ground plant.

Jeffrey engineers will help you determine the machine best suited to your operation both from the standpoint of increased production and low-cost operation. Consult them on your requirements.

AERODYNE FANS

A Jeffrey 12-A-58 Fan will be shown. It has 13" W. G. maximum pressure. Volumes up to 600,000 c.f.m. All Jeffrey fans are engineered to provide proper ventilation for your mine.





BLOWERS

Shown is a 5 H.P. AERODYNE midget Blower with Free Delivery Volume — 6200 c.f.m. Also Universal Blowers.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

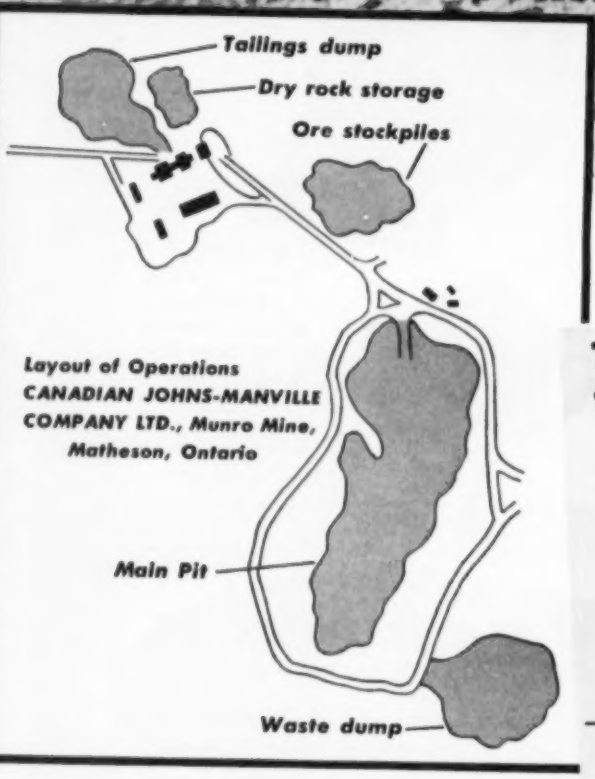
PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

JOHNS-MANVILLE uses

Tournatractor cleans snow from pit floor. Note good condition of tires after 3000 hours work on abrasive, rocky materials.



Layout of Operations
CANADIAN JOHNS-MANVILLE COMPANY LTD., Munro Mine, Matheson, Ontario

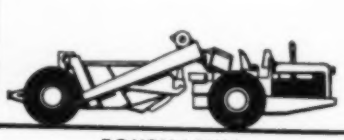
Tournatractor "time-table" for typical month's work

• Dozing ore to crusher, cleaning around 4 shovels, maintaining ore stockpile	238 hrs.
• Maintaining tailings dump	87 hrs.
• Maintaining waste dump	62 hrs.
• Towing equipment	43 hrs.
• Plowing snow	62 hrs.
• Odd jobs	43 hrs.
Total working time for month	**535 hrs.**

See them on the floor at the COAL SHOW

TOURNATRACTOR

TOURNAROCKER



TOURNAPULL

Tournatractor *on mine maintenance*

On tailings dump, "C" moves up to 3 cu. yds. per load. With big 21.00 x 25 low-pressure tires and 4-wheel drive, rig has plenty of flotation and traction in the soft, loose footing.

Canadian Johns-Manville Ltd., the world's largest asbestos producer, works a 19 mph, rubber-tired C Tournatractor on mine maintenance at their Munro open-pit near Matheson, Ontario.

Their 186 hp "C" works 24 hours per day, 6 days per week, handling scattered jobs. During a typical 24-hour period, rig maintains stockpile and dozes ore to crusher . . . cleans up for three 2½-yard shovels and one ¾-yard shovel . . . maintains tailings and waste dumps . . . clears gabro rock and wet blue clay overburden . . . tows compressors, wagon drills and other mine equipment. Unit moves from job to job without delay.

With Angledozer blade at full 20° angle, Tournatractor clears path 12' wide in one pass. Grade is 7% . . . temperature, 37° below zero. Rig often worked in temperatures of 50° below.

Plows 26 mi. of road in 6¾ hrs.

In addition to this regular mine maintenance, Tournatractor also plows snow. After one heavy snow, rig traveled 30 miles and cleared 26 miles of road in 6¾ hours! First, it opened the highway from the mine to the nearby town of Holtyre (8 miles). Then, it returned 4 miles over the same road to an intersection . . . plowed the road to Matheson (7 miles) . . . cleared city streets and company warehouse grounds there . . . and returned 11 miles to the mine, widening road it previously opened.

95% efficient over 3000 hours

At other times during the winter, the "C" plowed and maintained haul roads, helped pull shovel up steep grades on moves from pit to pit, and did odd jobs around the shop. In 3,000 working hours, Tournatractor recorded a 95% mechanical efficiency.

Why not find out for yourself how Tournatractor's 19 mph speeds on rubber can get more work done, at lower cost per job? Call your LeTourneau Distributor for a demonstration on your job at no obligation.

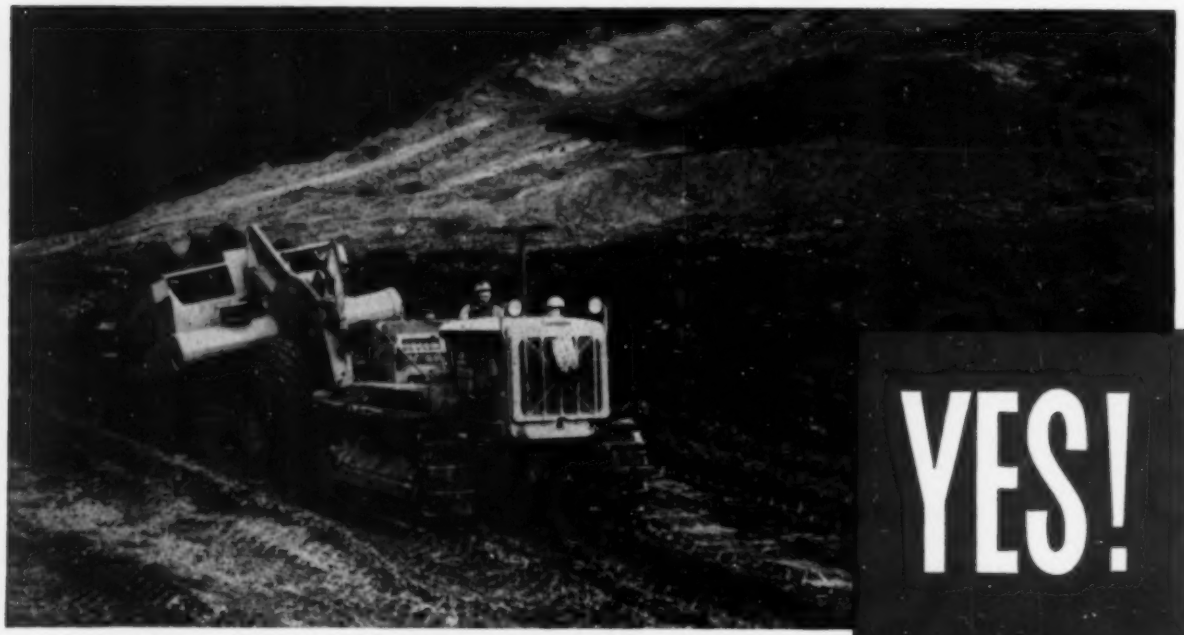
Tournatractor's ability to make self-powered moves anywhere at speeds up to 19 mph provides quick service to all parts of the Munro Mine . . . which processes 2,000 tons of rock through mill daily.

Angledozer—Trademark Reg. U. S. Pat. Off. Tournatractor—Trademark D-204-M

the dirtmovers that are world-famous for LOWEST-NET-COST-PER-YARD

R. G. LeTOURNEAU, INC.
Peoria, Illinois

Can U·S·S High Strength Steels cut



YES!

...and

● A Caterpillar D8 Diesel Tractor and Scraper strips overburden at a coal mine in Edmonton, Canada. To take daily beating and grinding as shown, while increasing the payload, Caterpillar has found considerable use for U·S·S TRI-TEN steel in building these machines.

● When you go underground, you are likely to have damp, corrosive conditions. But smart operators lick the corrosion problem by using cars made of U·S·S COR-TEN steel. The method generally chosen is to substitute COR-TEN steel for carbon steel, with no reduction of section, to get greater durability and longer car life.

your operating costs?

● This big baby, built by the Euclid Road Machinery Company, has a capacity of 60 cubic yards. U·S·S TRI-TEN steel was used to provide maximum strength with least possible weight.

here's how!

U·S·S HIGH STRENGTH STEELS have a yield point 50% higher than ordinary structural steel. That means that equipment built with these famous steels will last longer, do more, and take more punishment. And each part of your equipment can be given the particular qualities it needs to do its job best.

U·S·S COR-TEN steel, for example, will provide four to six times the resistance to atmospheric corrosion of structural steel.

U·S·S A-R (Abrasion-Resisting) steel offers superior resistance to scuffing and scraping that causes so many mine equipment failures.

U·S·S TRI-TEN steel will give equipment the ability to withstand shock at sub-zero temperatures.

And with either U·S·S COR-TEN or U·S·S TRI-TEN steels you can increase the fatigue strength of parts *without increasing their weight*. Or, you can use these steels in lighter sections and *reduce weight*, while retaining the same strength factors as you would have with plain structural steel.

Any way you look at it, this adds up to just one thing. You cut costs when you use U·S·S HIGH STRENGTH STEELS. Equipment lasts longer, there are fewer time-wasting, profit-killing breakdowns, there is less money spent on replacement parts. And the job gets done faster.

If you'd like to have more facts about cutting costs with U·S·S HIGH STRENGTH STEELS, write to our nearest district sales office.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S HIGH STRENGTH STEELS

USS

S-1014

UNITED STATES STEEL

BOWDIL FABRI-FORGED CUTTER CHAIN

The Fabri-Forged Cutter Chain is another development by Bowdil, brought to a high degree of perfection by modern production methods, metallurgical knowledge and heat-treating practice.

Designed for maximum, trouble-free service and constructed throughout of highest quality materials, carefully selected and processed, it will give long satisfaction on all types of cutter heads and under all kinds of service conditions.

Despite its great strength and ruggedness and numerous advantageous design features, Fabri-Forged Cutter Chain is no heavier than other chains and is easy to maintain.

Used in hundreds of mines throughout the coal fields of the nation, it has set the standard for cutter chain performance and won the approval of operators everywhere.

WHY *FABRI-FORGED* CUTTER CHAIN saves time and reduces costs 6 WAYS

1. **Less Wear and Damage to Guides and Wearing Strips.** Bowdil's true-running radial track guide makes the chain circle the head at the correct angle, giving a smooth, wobble-free run that minimizes wear and prevents damage to guides and wearing strips.

2. **Extra Strength.** The drop-forged lug bodies and connectors are of equal strength . . . strong enough to withstand many times normal loads. There are no weak spots in Fabri-Forged Chain.

3. **Easy to Maintain.** Bowdil design makes removal, replacement and connection quick and easy. The simple, ingenious rivet lock principle makes it easy to remove the pin and bushing yet holds the assembly securely.

4. **Fast Bit Replacement** Bowdil's one-piece holder wedges the bit secureiy in the lug projection. Individual replacement bits can be quickly and easily inserted and locked in position by means of a set screw with-

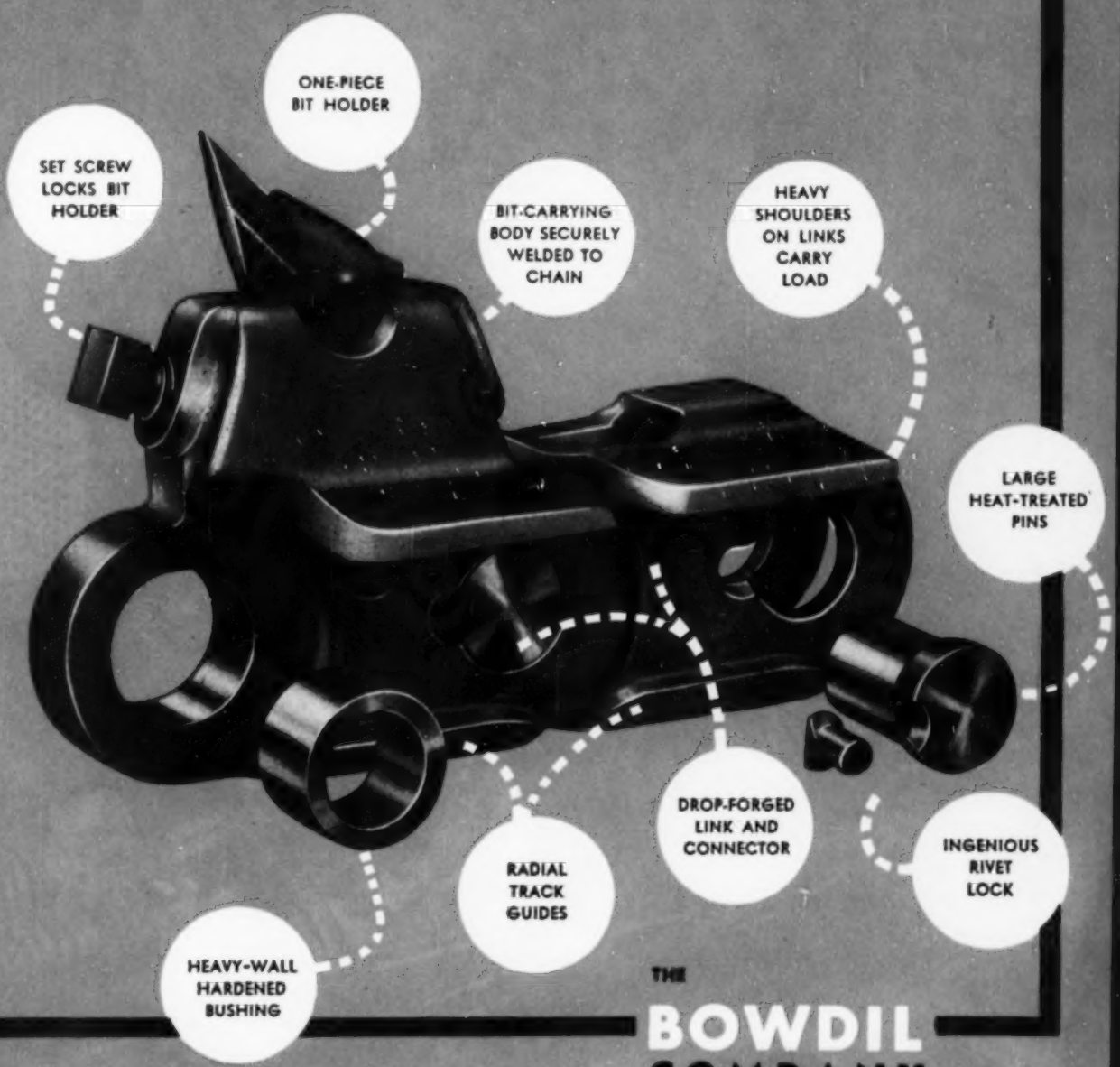
AT THE SHOW — BOOTH 1006

6 WAYS, CONTINUED

out removing the holder. No need to halt production for complete chain replacement when a few bits become badly worn or broken.

5. Fits Any Job. Bowdil's bit-carrying body is securely welded on the chain to meet any requirement for position, lacing or kerf.

6. Long Life. Large alloy steel pins and bushings, heat treated for maximum resistance to wear, take the wearing action. Heavy shoulders on links and lugs carry the load and shock . . . distribute stress . . . lengthen the life and increase the efficiency of the entire cutting end of the machine


ONE-PIECE BIT HOLDER
SET SCREW LOCKS BIT HOLDER
BIT-CARRYING BODY SECURELY WELDED TO CHAIN
HEAVY SHOULDERS ON LINKS CARRY LOAD
LARGE HEAT-TREATED PINS
DROP-FORGED LINK AND CONNECTOR
INGENIOUS RIVET LOCK
RADIAL TRACK GUIDES
HEAVY-WALL HARDENED BUSHING

THE

BOWDIL COMPANY

CANTON, OHIO

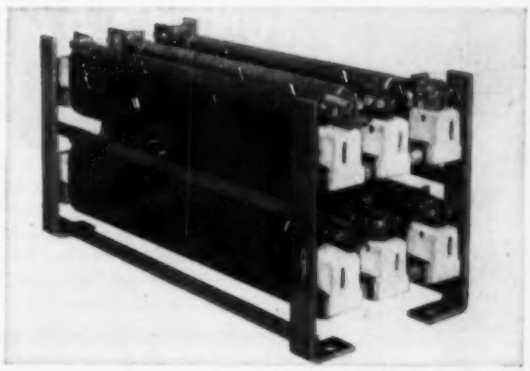
1878 75 1953
YEARS OF ELECTRICAL PROGRESS

You get replacements when you need them with G.E.'s new, standard EWF resistors

When you're in need of a new resistor for your G-E mine locomotive, that's the time to take advantage of General Electric's new line of standardized EWF accelerating resistors.

Your ordering is simplified and shipments are made promptly from stock because G-E EWF resistors are predesigned to eliminate guesswork and special engineering attention whenever your replacement needs arise. If your G-E mine locomotives operate on either 250 or 500 volts d-c, weigh between four and 15 tons, use drum controllers, and are rated between 13 and 65 horsepower, a standard accelerating resistor with a choice of boxing arrangements is readily available from stock. Your order is processed without delay and shipment made within a matter of days.

To get top performance—"original equipment" performance—from your G-E mine locomotives, always specify G-E standard EWF resistors. They're the best you can buy for your G-E mine locomotives. For full pricing and product information, contact your nearest G-E Apparatus Sales Office, General Electric Co., Schenectady 5, New York. 128-11



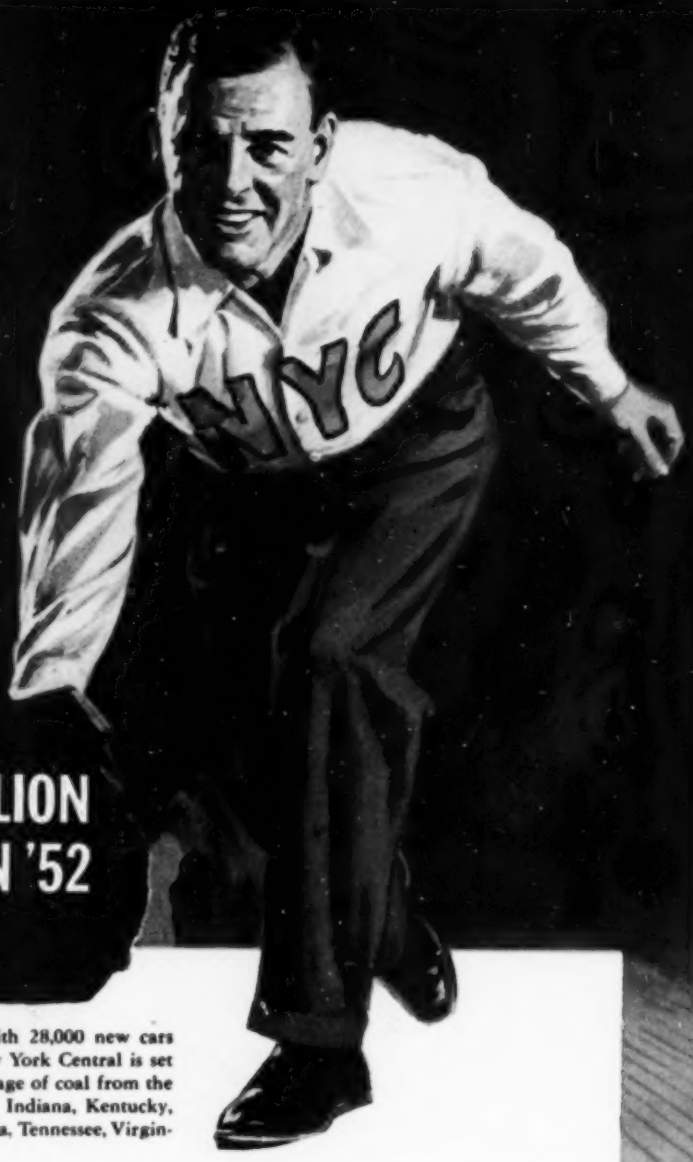
WHY G-E EWF RESISTORS ARE LONG-LIVED

G-E EWF accelerating resistors last long, serve you efficiently. Their floating steel backbone expands and contracts freely with high temperature changes, is not subject to buckling forces. Their ceramic end-supports account for exceptionally good insulation between units and to ground. They are lightweight, sturdy and stand up under shock and vibration. Their edgewise-wound, steel-alloy ribbons pack more kilowatt capacity into a smaller space, assure ample ventilation, and endure severe service shocks.

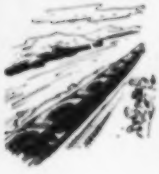
SEE US AT THE COAL SHOW, CLEVELAND, MAY 11–14

GENERAL ELECTRIC

COAL is right down our alley!



70 MILLION TONS IN '52



BOWLING ALONG! With 28,000 new cars added to its fleet, New York Central is set to speed a record tonnage of coal from the mine fields of Illinois, Indiana, Kentucky, Maryland, Pennsylvania, Tennessee, Virginia, West Virginia.

SMOOTH FORM! Gentle coal handling marks New York Central's modern docks at Ashtabula, Chicago, Oswego . . . and, of course, the newest Great Lakes coal terminal of all, Central's docks on the obstruction-free Toledo lake-front.

YOUR SET-UP! A multi-million-ton market More coal-generated electric power . . . expanding steel and chemical industries . . . in addition to coal-heated homes . . . all help to make the New York Central area your No. 1 market for coal.

FOR EXPERT HELP with coal shipment, development or supply, contact these New York Central coal traffic representatives:

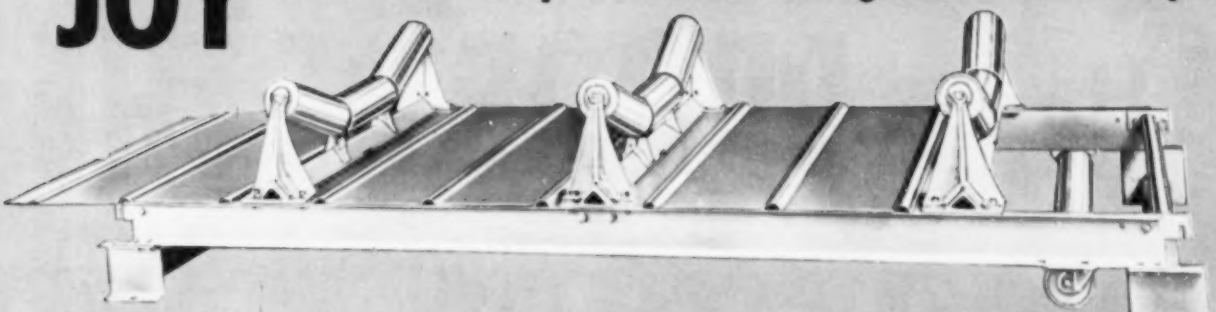
H. L. WILLARD, General Coal Traffic Manager, New York, N. Y.; P. P. BELITZ, Coal Traffic Manager, Cleveland, Ohio; F. P. SOEN, Coal Traffic Manager, New York, N. Y.; A. W. BEHRENS, General Coal Freight Agent, Chicago, Ill.; P. J. SCHWEIBINZ, General Coal Freight Agent, Pittsburgh, Pa.; G. E. WHEELER, General Coal Freight Agent, Detroit, Mich.; G. W. CHILDERS, General Coal Freight Agent, Cincinnati, Ohio.

LEADING USER OF BITUMINOUS COAL FOR LOCOMOTIVE FUEL

NEW YORK CENTRAL

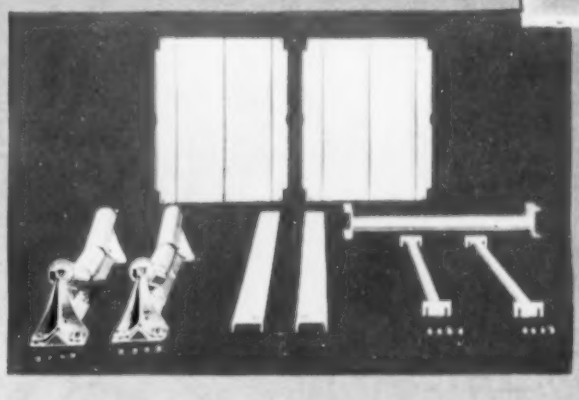
General Offices: 466 Lexington Ave., New York 17, N. Y.

JOY... the most complete line of Underground Belt Conveyors



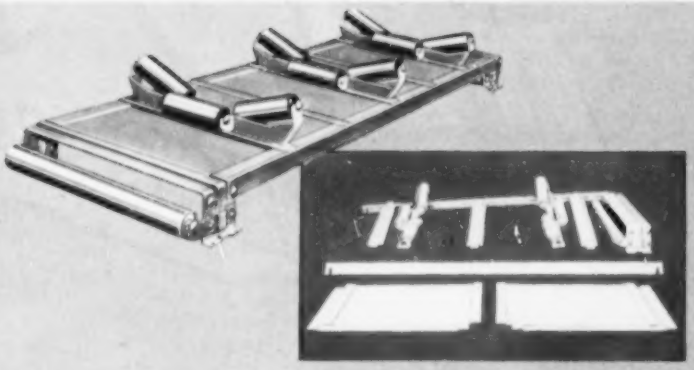
ABOVE: 12′ Intermediate Conveyor Section for very heavy duty. Unit is knockdown type, for use with 48″ belt. For additional strength, cover sheets are corrugated—stringers are of 6″ channel steel. Cross pipe spacers, which drop into place without bolts, rigidly brace the section and hold it in alignment. The cover sheets *lap under* the troughing idler base angles to prevent leakage. Belt idlers have grease-type bearings as standard equipment, but can be furnished with sealed, precision bearings.

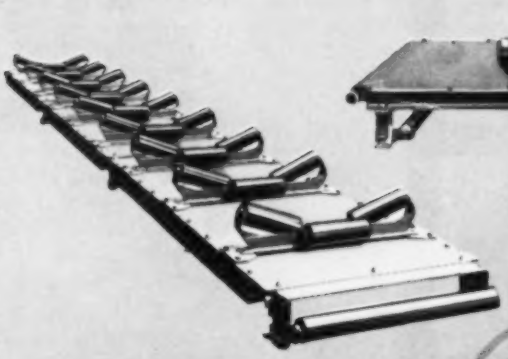
RIGHT: 8′ Intermediate Conveyor Section, similar in design to above, for use with 42″ wide belt. This unit can be knocked down into easily handled pieces, as shown, for easy transportation.

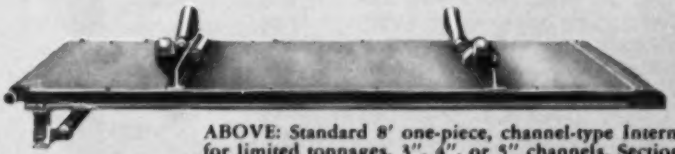


RIGHT: 9′ Intermediate Conveyor Section of knockdown design. Can be furnished for 26-30-36-or-42″ belts. Belt idlers have sealed, precision bearings. Cradle is heavy, die-formed, ribbed pressed steel. This is a heavy duty unit of minimum height—15¾″ to 18¾″—for use in thin-seam mining.

RIGHT, BELOW: Similar style in 8′ length. Note that the only bolts used in joining are those which anchor the troughing idler brackets to the side rails.







ABOVE: Standard 8′ one-piece, channel-type Intermediate Section for limited tonnages. 3″, 4″, or 5″ channels. Sections are self-contained with cross pipe-spacers welded between channels. Pivotal section connection. Section connection made without bolts or loose parts of any kind.

LEFT: Three 9′ sections joined together. Each is of one-piece, welded construction. Side rails are 5″ steel channels. Ribbed pressed steel cradle. Pivotal section connections. For 30″, 36″ (illustrated), or 42″ belts.

Consult a Joy Engineer

WDB CL 4940

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

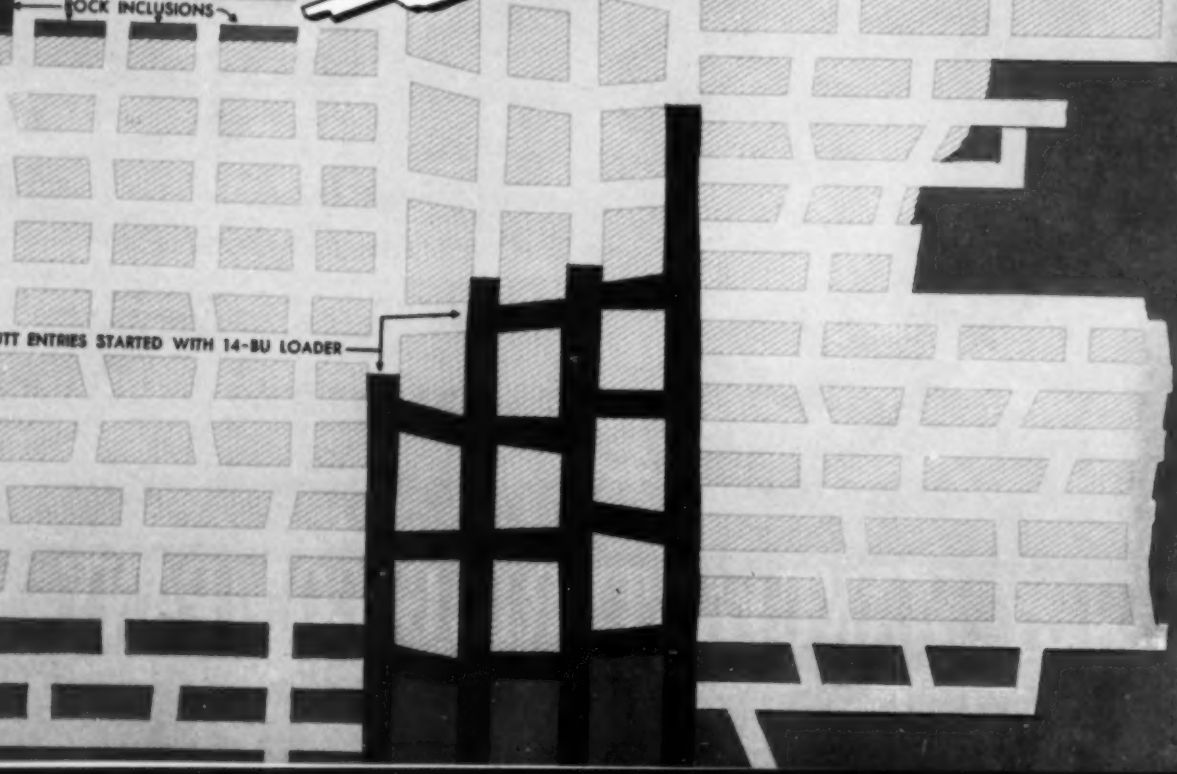
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

Here's PROOF OF THE

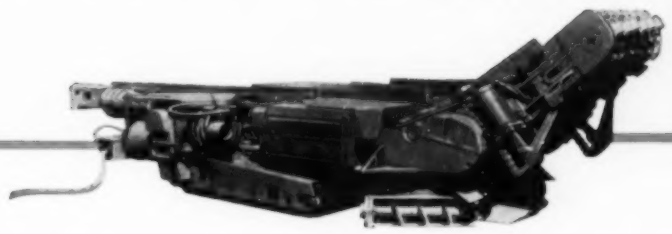
DOING THE ENTIRE JOB... WITH

84.5%

COAL RECOVERY!!



VERSATILITY of the JOY CONTINUOUS MINER



HERE ARE THE DETAILS:

Mine: Located in central Pennsylvania, operating in the Lower Kittanning seam.

Conditions: Considered generally fair in this section. Height of the coal was 40″ to 46″. There was no top boney. Part of the roof was sandstone, part slate. The floor was of hard fireclay nature, fairly level.

Machine Model: The Joy 3-JCM Continuous Miner.

How Used: Placed in a set of four butt entries previously started with a 14-BU Loader. The Miner completed driving the entries, mined the rooms to right and left of the entries and extracted all pillars, including the entry pillars.

Auxiliary Equipment: Two shuttle cars were used back of the Miner. They discharged the coal on a belt conveyor which, in turn, spilled the coal on another belt conveyor.

Crew: Four men—two on the Miner and two shuttle car operators. They also used a Face Boss and one mechanic on each machine shift. No man was needed at the belt head, since this belt spilled the coal directly on the main haulage belt.

Total Coal in Area: 124,916 tons

Total Coal Recovered: 105,507 tons

Recovery percentage: 84.5%

Time Span: 620 days (started Dec. 11, 1950 and finished August 22, 1952). The machine worked 771 shifts on a double shift basis.

Shift Tonnage: 136.84 tons/shift

Man Tonnage: 34.21 tons/face man, which of course included all delay time.

The versatile, powerful Joy Continuous Miner can operate in any mine it can enter. Thin seams, thick seams, split seams—all can be efficiently worked without shooting.

The mined-out section illustrated on the facing page is a typical performance. This case history is just one more of the many instances which amply prove that the Miner will do a quick, thorough job of developing entries and driving rooms, and in addition, a top-notch pillar-recovery job.

In fact, users will tell you that the Joy Continuous Miner actually is "the best machine developed to date for extracting pillars."

The 3-JCM can be furnished either 34″ or 39½″ high, and will mine from 6″ below to 66″ above bottom. The 4-JCM is available in 48″ or 53¼″ heights, and will mine from 5½″ below to 98½″ above bottom. Special equipment will permit the 3-JCM to mine to 76″ above bottom, and the 4-JCM to 120″ above bottom. A third model, the 2-WM, is available for mines operating in very low coal, handling seams as thin as 30″.

Let us show you how the Continuous Miner will fit into your operation, to give you high-production mining at absolute rock-bottom cost per ton of coal mined. ● *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario*

Consult a Joy Engineer

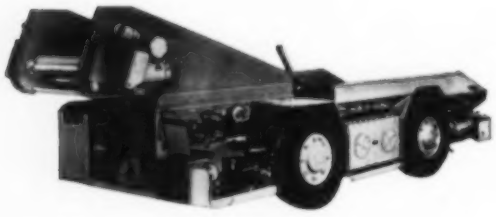
JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

W&D CL-4414

Meet the Champ—The 1953 Model 10-SC!

It's the fastest round-trip SHUTTLE CAR built for high-production mining today.



The improved Joy 10-SC Shuttle Car is available as a Permissible or Non-Permissible unit, for net payload capacities up to 10 tons. It is built in 43", 48" or 54" heights (machine only) and may be equipped with 4", 6" or 8" sideboards. Tramming speed loaded is approximately 4½ m.p.h., and the unit is equipped with Joy-pioneered hydraulic cable reel, and hydraulically adjustable elevating discharge. Other special features include: 4-wheel drive, 4-wheel positive steering (hydraulic "power" type) and 4-wheel disc-type brakes, unaffected by dirt, coal dust, oil or water . . . improved arrangement of operator's controls . . . new "zone"-type lubrication . . . dependable Joy "Magnetax" controls, etc.

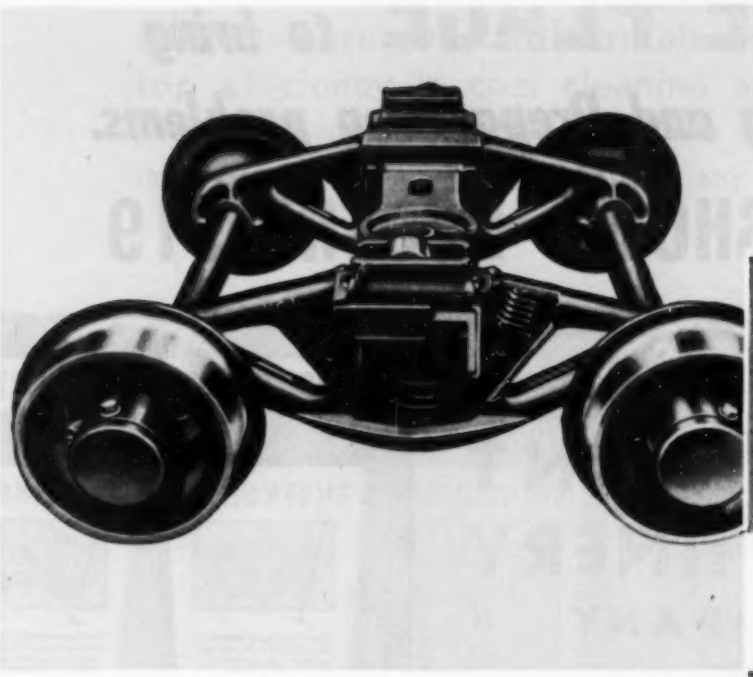
The Joy 10-SC Shuttle Car is famous for dependable, high-tonnage hauling under the toughest conditions, such as handling full loads of coal or rock in split-seam mining, etc. But we've improved it! The 1953-model 10-SC can get from the face to the discharge point and back again for another payload *faster than any other car in its class.* For some of the reasons why, check these features: traction motors of new design, with more reserve power . . . higher-speed, higher-powered conveyor discharge, cutting unloading time as much as half . . . over-capacity wheel units, brakes, gearing and frame for the least possible down-time and maintenance costs. ● There's actually nothing in the field like the 10-SC! Let us give you complete details. ***Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

W&D CL4595

JOY

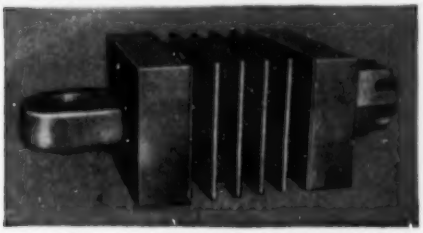
WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT



The NC-1 Truck climaxes 20 years of intensive research, providing (through the friction control mechanism shown in cutaway) protection to equipment, roadbed and lading with maximum wear life.

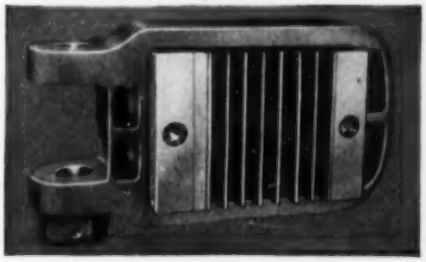
Willison Automatic Couplers save time with maximum safety . . . can be coupled at either end of car or locomotive . . . require no manual assistance. Close coupling eliminates damaging slack, permits high speeds with maximum stability.

NATIONAL *products cut per ton costs!*



National M-230 Rubber-Cushioned Draft Gear for cars operating through rotary dump. Soft initial-action, high-capacity rubber pads provide maximum impact protection, lengthen equipment life. Available in a range of capacities and design variations to fit individual requirements.

Latest example of National's pioneering in better equipment is the NC-1 Truck. Its sweeping advancements over conventional trucks include long soft springs, a friction mechanism—controlling vertical and transverse oscillations, a cast one-piece bolster with large lubricated center connection, and automatic frame alignment. The NC-1 has been designed with the same factor of safety that is required by the Association of American Railroads for full size railroad trucks, and embodies the same features which A.A.R. tests have shown to be essential to produce good riding qualities. For the best in profitable equipment, *always specify National products.*



M-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Maximum protection in minimum space.

A-1063

Be sure to visit Booth 1618 at the American Mining Congress 1953 Coal Convention and Exposition • May 11-14 • Cleveland, Ohio

NATIONAL Products FOR TRANSPORTATION AND INDUSTRY Est. 1868

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

Cleveland 6, Ohio

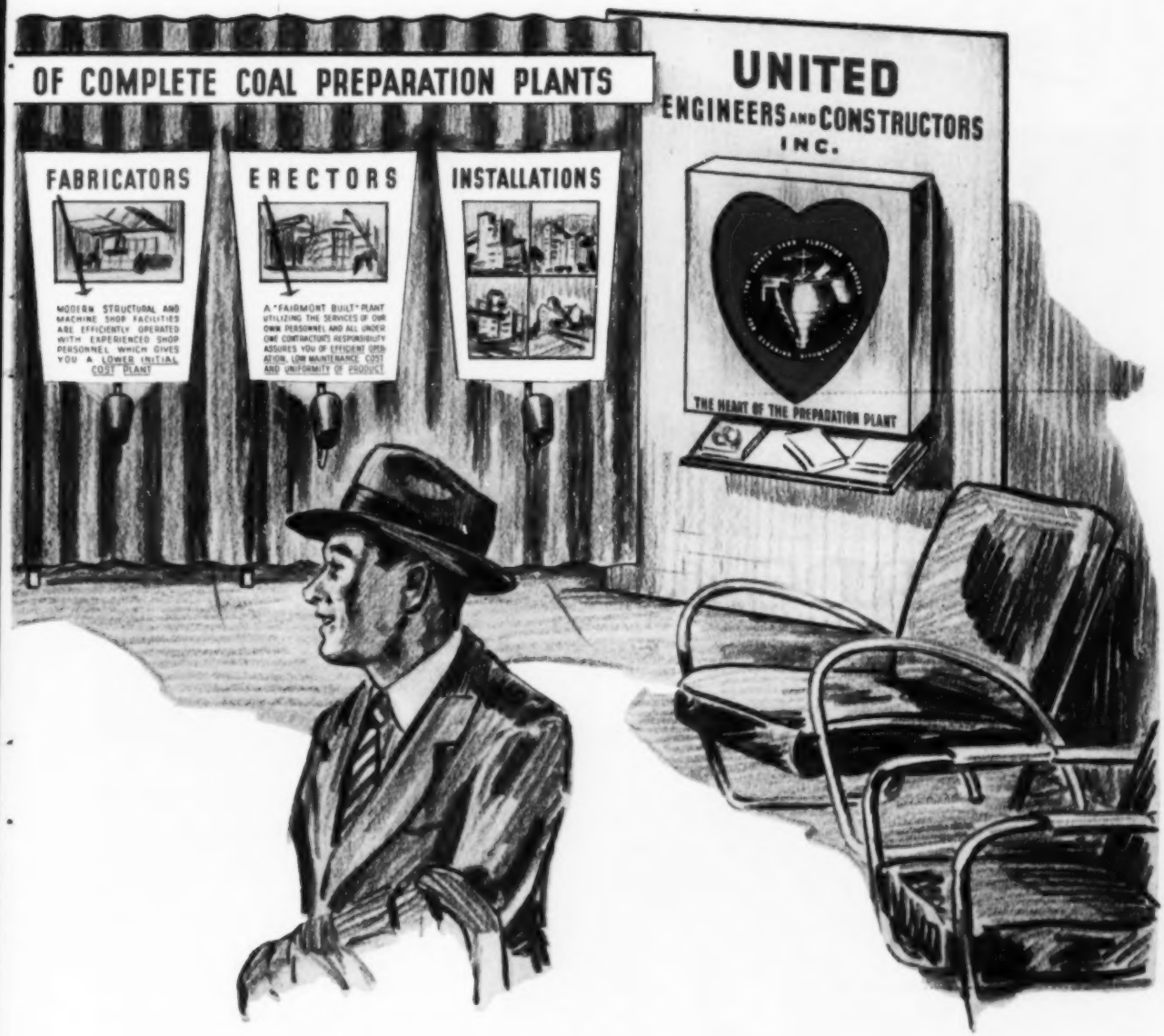
Willison Automatic Couplers • Friction & Rubber Draft Gears • Car Trucks • NACO Steel Wheels • NACO Steel Links & Swivel Hitchings

Here's THE PLACE *to bring your coal Cleaning and Preparation problems.*

COAL SHOW—BOOTH 1519

Here's where you can learn about GUARANTEED top efficiency in coal cleaning and preparation.

"Fairmont-Built" Guaranteed plants can be designed in sizes ranging from 40 tons per hour up to any desired capacity, to suit your individual requirements.


OF COMPLETE COAL PREPARATION PLANTS
FABRICATORS
MODERN STRUCTURAL AND MACHINE SHOP FACILITIES ARE EFFICIENTLY OPERATED WITH EXPERIENCED SHOP PERSONNEL WHICH GIVES YOU A LOWER INITIAL COST PLANT
ERECTORS
A "FAIRMONT BUILT" PLANT UTILIZING THE SERVICES OF OUR OWN PERSONNEL AND ALL UNDER ONE CONTRACTOR'S RESPONSIBILITY ASSURES YOU OF EFFICIENT OPERATION, LOW MAINTENANCE COST AND UNIFORMITY OF PRODUCT
INSTALLATIONS
UNITED
ENGINEERS AND CONSTRUCTORS
INC.
THE HEART OF THE PREPARATION PLANT

FAIRMONT MACHINERY COMPANY

FAIRMONT, WEST VIRGINIA

Designers and Constructors of Complete Coal Preparation Plants Using Both Wet and Dry Cleaning, Centrifugal and Thermal Drying

AT THE COAL SHOW

make it a point to

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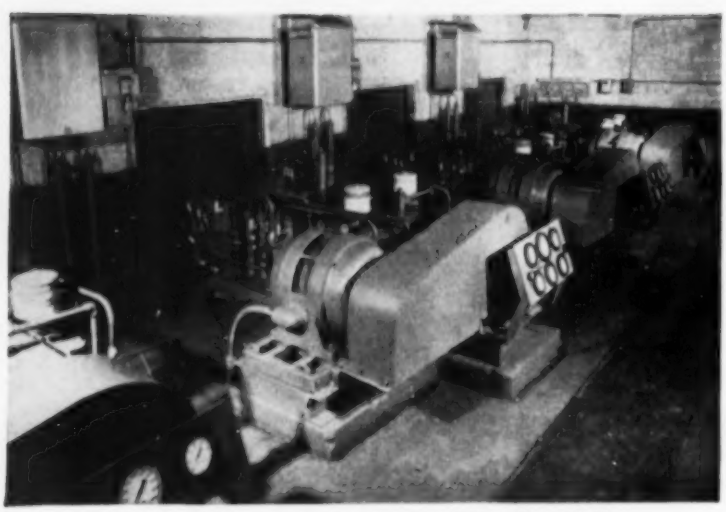
NEW IDEAS and IMPROVED METHODS

Our engineers will be on hand to welcome you . . . to answer your questions on the methods and equipment you see here or on any other of our products. You'll come away with profitable ideas on ways and means to save money through lower operating costs!

CARDOX

AIRDOX

The Cheapest Means Known for Face Preparation



AIRDOX Compressors in a large mine—"Capacity" to break about 3000 tons every 8 hours.

There are three major reasons why AIRDOX produces coal at lower cost per ton than any other mining method.

- In practically every case, the actual cost of dislodging is less with AIRDOX.
- The manner in which AIRDOX dislodges the coal materially increases its loadability.
- Cleaning costs are reduced because of the comparatively lower percentage of fines.

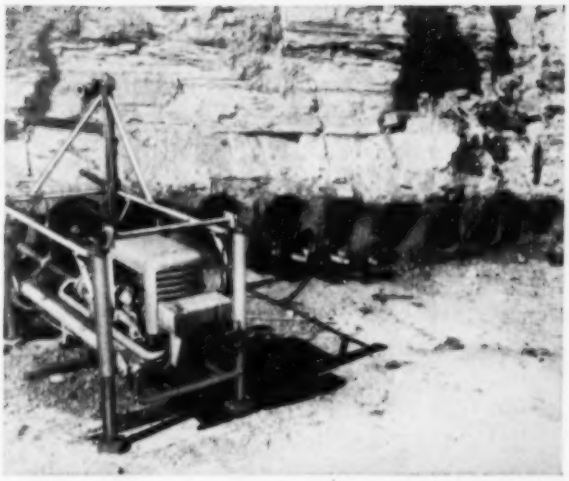
In addition AIRDOX provides greater safety to men, better protection to roof structure. It is understandable that more and more mines are turning to this non-explosive mining method using compressed air to increase the profit spread of their operations. Get the facts at the Coal Show, or write for further information.

CARDOX

Surface AUGER MINER

drills under the overburden—
turns abandoned coal into
high-profit tonnage

When excessive overburden makes conventional stripping unprofitable, a CARDOX Surface AugerMiner enables you to bore back into the seam as much as 100 to 120 feet from the face. Driven by a rugged 145 H. P. engine, augers up to 36 inches in diameter, drill out pure, clean coal, ready for mechanical loading. Auger lengths in 6 foot sections are easily added or removed by the built-in retriever. Directional control and hydraulic positioning keep the auger drilling into the best part of the seam, away from rock and shale. Units can be towed or trucked easily.



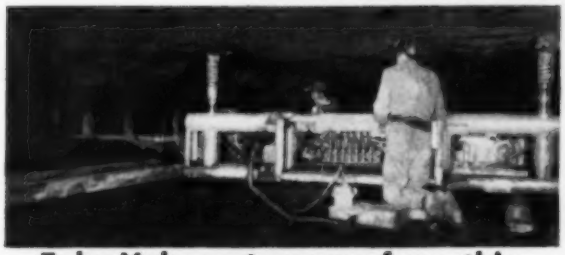
Because there is little or no development cost, CARDOX AugerMiners salvage coal at a cost usually far less than for the original working.

NON-EXPLOSIVE MINING METHODS and DRILLING EQUIPMENT

NEW HIGH-CAPACITY

CARDOX

Underground AUGER MINER



Take Volume tonnage from thin seam or poor roof areas

Stepped-up power insures excellent volume at low-per-ton cost where thin seams or poor roof areas make conventional mining unprofitable or unsafe. Every ton recovered is "bonus" tonnage you'd otherwise lose. Directional control keeps the auger out of impurites from roof or bottom. Operators never have to leave safe areas! Perfectly adapted to mechanized loading.

Ask about this unit at the COAL SHOW, or write for more information.

CARDOX-HARDSOCG

VERTICAL DRILLS

For fast, easy drilling of blast holes— at low cost per hole

Simple, rugged and very easy to use. The weight of the engine forces the auger and cutterhead into the material being drilled. Large hand wheel raises and lowers the power assembly easily. Mast can be lowered when moving unit. Available with 6½ H. P. or 12 H. P. air-cooled gasoline engine. Standard auger equipment includes 6 foot section for 2½" or 3" holes. Other sizes also available.

CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS

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Phone: Evansville 2-8944

Pikeville, Kentucky
Route 2, Box 99
Phone: Robinson Creek 5

Library, Pennsylvania
Box 427
Phone: Library, Colonial 3-6910

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Phone: Louisville 234

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Phone: Ottumwa 51

FOR THE FIRST TIME

Here's the Heyl & Patterson

SEE
"JET-INJECTION"
in actual operation
at the 1953 Coal Show

Visit Heyl & Patterson—Booth 1529

"JET-INJECTION" Cyclone

that makes H&P Cyclone Performance better than ever for desliming and classifying

Heyl & Patterson Cyclone Thickener Equipment . . . well known and accepted for efficient, low-cost thickening, classifying, clarifying and desliming . . . now has expanded limits of performance, with the new Heyl & Patterson "Jet-Injection" Cyclone.

In "Jet-Injection" operations, water is forced into the Cyclone at a definite rate and under controlled pressure. This results in a sharper and a more accurate classification of the slurry provided the installation is properly engineered and "Jet-Injection" correctly applied.

During desliming or classifying operations, objectionable slimes that formerly reported to the underflow of the Cyclone with the "wanted" materials can now be removed in the overflow with "Jet-Injection."

And, of great importance, there is no decrease in the recovery of the "wanted" materials with "Jet-Injection."

PROOF OF "JET-INJECTION" PERFORMANCE

Results of tests that were made in the Heyl & Patterson laboratory and in the field under actual operating conditions show the advantages of "Jet-Injection":

TEST #1

PROBLEM: Deslime a slurry having 10% solids concentration by weight containing 70% minus 325 mesh (minus 44 microns) material with a Heyl & Patterson Cyclone.

RESULTS *WITHOUT* "JET-INJECTION": Recovered product contained 10% minus 325 mesh material.

RESULTS *WITH* "JET-INJECTION": Recovered product contained 4.6% minus 325 mesh material.

TEST #2

PROBLEM: Classify a slurry having 10% solids concentration by weight containing 30% minus 200 mesh (minus 74 microns) material with a Heyl & Patterson Cyclone.

RESULTS *WITHOUT* "JET-INJECTION": Recovered product contained 8% minus 200 mesh material.

RESULTS *WITH* "JET-INJECTION": Recovered product contained 4% minus 200 mesh material.

These results were accomplished without any loss of "wanted" materials.

WHEN YOU TALK, THINK OR DECIDE ABOUT CYCLONES, REMEMBER . . .

. . . Heyl & Patterson's experience pays off for you. Heyl & Patterson research engineers have spent thousands upon thousands of hours experimenting with and perfecting H & P Cyclone Thickener equipment.

This extensive experience, combined with our testing facilities, enables Heyl & Patterson engineers to predict accurately the Cyclone performance in almost any situation.

You save time, money and worry when you call on H & P's experience and know-how to help you with your problem of thickening, classifying or clarifying.

For complete information on H & P Cyclone Thickeners and the new "Jet-Injection" write for our booklet CT-31.

Cyclone Thickeners
Thermal Dryers
The Drying Dutchman
Reinoveld Centrifugal Dryer
Thorsten Coal Handling Systems
Rotary Mine Car Dumpers
Coal Crushers
Coal Preparation Plants
Bradford Breakers

Heyl & Patterson, Inc.

"SINCE 1887"

55 WATER STREET · PITTSBURGH 22, PA

a COMPLETE LINE of carbide-tipped MINING BITS

lowers costs wherever cutting or drilling is done

Kennametal Cutter Bits are available in 17 styles, for medium, hard, and severe cutting conditions.

Kennametal Drill Bits are furnished in several tip and shank designs, with or without core breakers.

Rotary Roof Bits are produced in three tip and shank designs, in sizes from 1¼" to 2¼".

Multiple point Rock Bits offer fast drilling speeds in ravelly and fissured material. Chisel-type Rock Bits are recommended for hard, uniform material.

KENNAMETAL produces the world's most extensive line of carbide-tipped mining bits and accessories, engineered and designed for economical service in any cutting or drilling condition.

Tough Kennametal tips stay sharp longer, take harder knocks than any other tungsten-carbide. Heat-treated, high quality steel shanks provide full tip support.

Cutting and drilling is faster, with fewer bit changes. Important savings are made in machine and bit maintenance, parts replacements, and power consumption.

Your Kennametal Representative—a man with years of actual mining experience—will gladly demonstrate the proven quality of Kennametal. Call him anytime, without obligation.

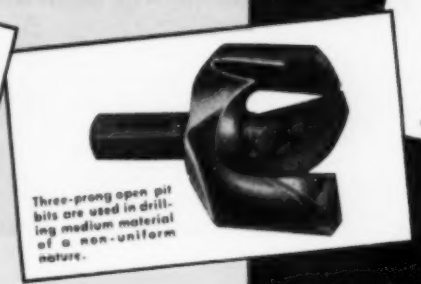
•

KENNAMETAL®

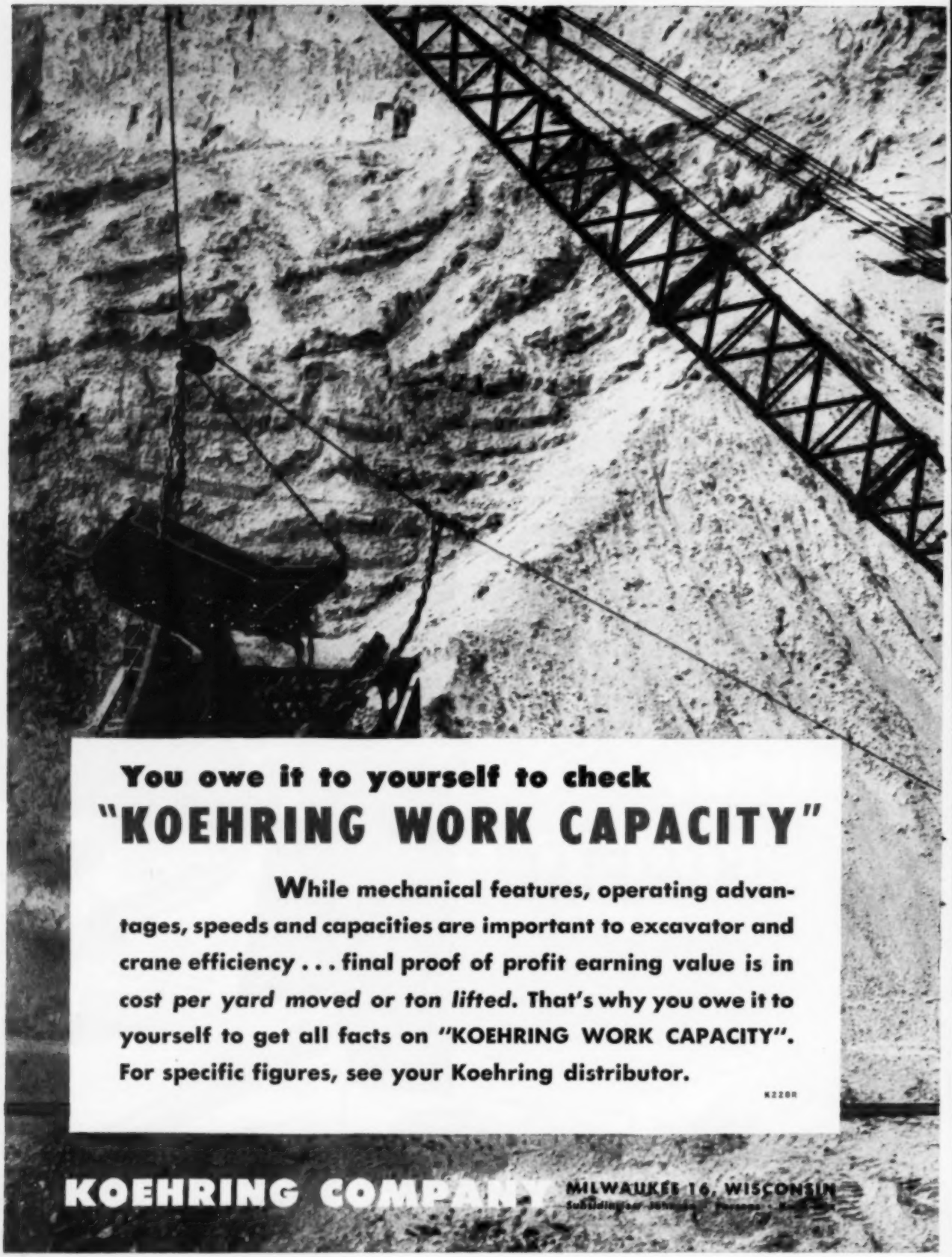
KENNAMETAL INC., MINING TOOL DIVISION
BEDFORD, PA.
GENERAL OFFICES and MAIN PLANT at LATROBE, PA.
WORLD'S LARGEST MANUFACTURER OF TUNGSTEN CARBIDE
DRILL BITS, CUTTER BITS, ROOF BITS, STRIP BITS

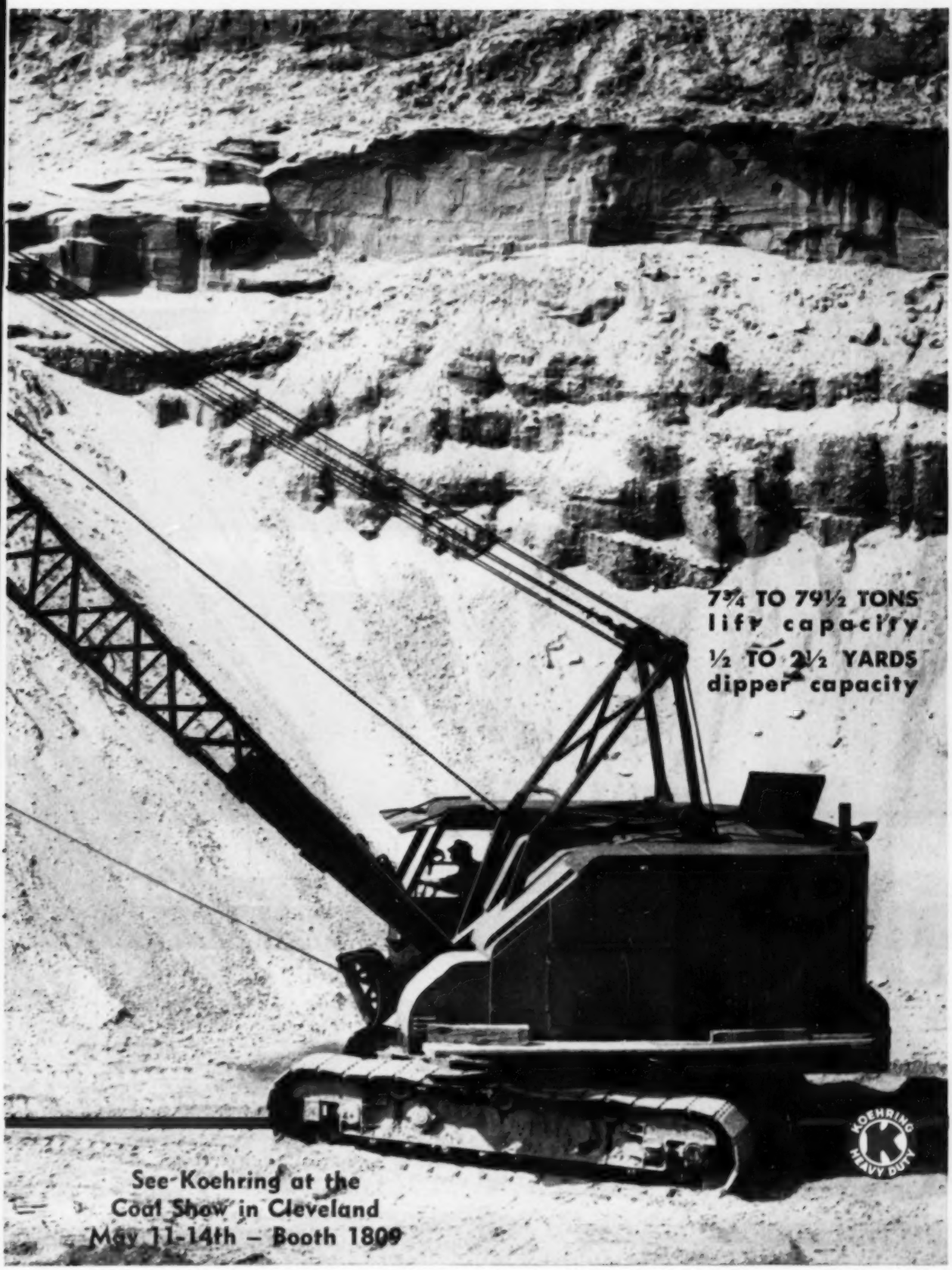
Kennametal Accessories — Core Breakers, and Pilots.

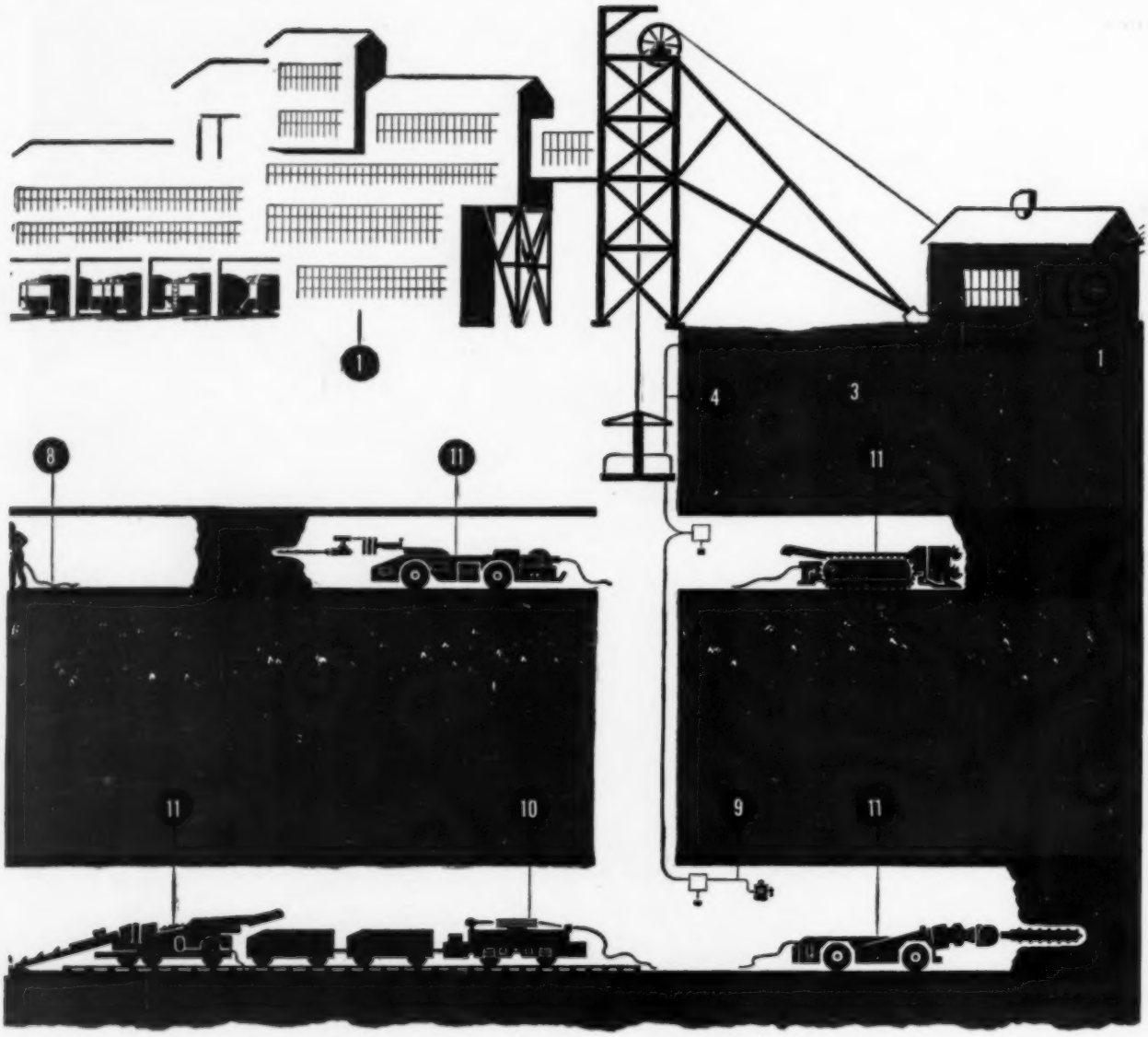
Kennametal Drag Bits are used in exploratory, grout, and production drilling.


Three-prong open pit bits are used in drilling medium material of a non-uniform nature.

Kennametal Masonry Drills drill spad holes, and other small diameter holes in mine maintenance and repair work.


You owe it to yourself to check
"KOEHRING WORK CAPACITY"
While mechanical features, operating advantages, speeds and capacities are important to excavator and crane efficiency . . . final proof of profit earning value is in cost per yard moved or ton lifted. That's why you owe it to yourself to get all facts on "KOEHRING WORK CAPACITY". For specific figures, see your Koehring distributor.
K220R
KOEHRING COMPANY
MILWAUKEE 16, WISCONSIN


7¾ TO 79½ TONS
lift capacity
½ TO 2½ YARDS
dipper capacity
See Koehring at the
Coal Show in Cleveland
May 11-14th – Booth 1809
KOEHRING
HEAVY DUTY



1. **PREPARATION PLANT, WASHERY, SUBSTATIONS, SURFACE BUILDINGS** — Hazaprene Wire, Hazard Armored Cable, Hazacord Flexible Cords, Hazard Industrial Wiring, Hazardex

2. **SURFACE POWER DISTRIBUTION**
Aerial Cable, Hazaprene Line Wire

3. **UNDERGROUND DISTRIBUTION (BURIED OR IN DUCTS)**
Hazasheath, Armortite, Parkway, Hazaprene Wire (ducts)

4. **SHAFT SIGNAL AND TELEPHONE CIRCUITS**
Steel Wire Armored, Hazaprene Sheathed, Spiralweave

5. **BOREHOLE AND SHAFT POWER CIRCUITS**
Steel Wire Armored, Hazaprene Sheathed, Spiralweave

6. **SHOVEL, DREDGE AND DRAGLINE** — Hazacord Portable Cables Types W, G, SH-A, SH-B, SH-C, SH-D

7. **SHOT-FIRING** — Hazacord, Redshot Type RG, Type D Braided, Hazakrome Type TP

8. **HAND-HELD DRILLS, REMOTE CONTROL CIRCUITS**
Hazacord Remote Control and Drill Cord

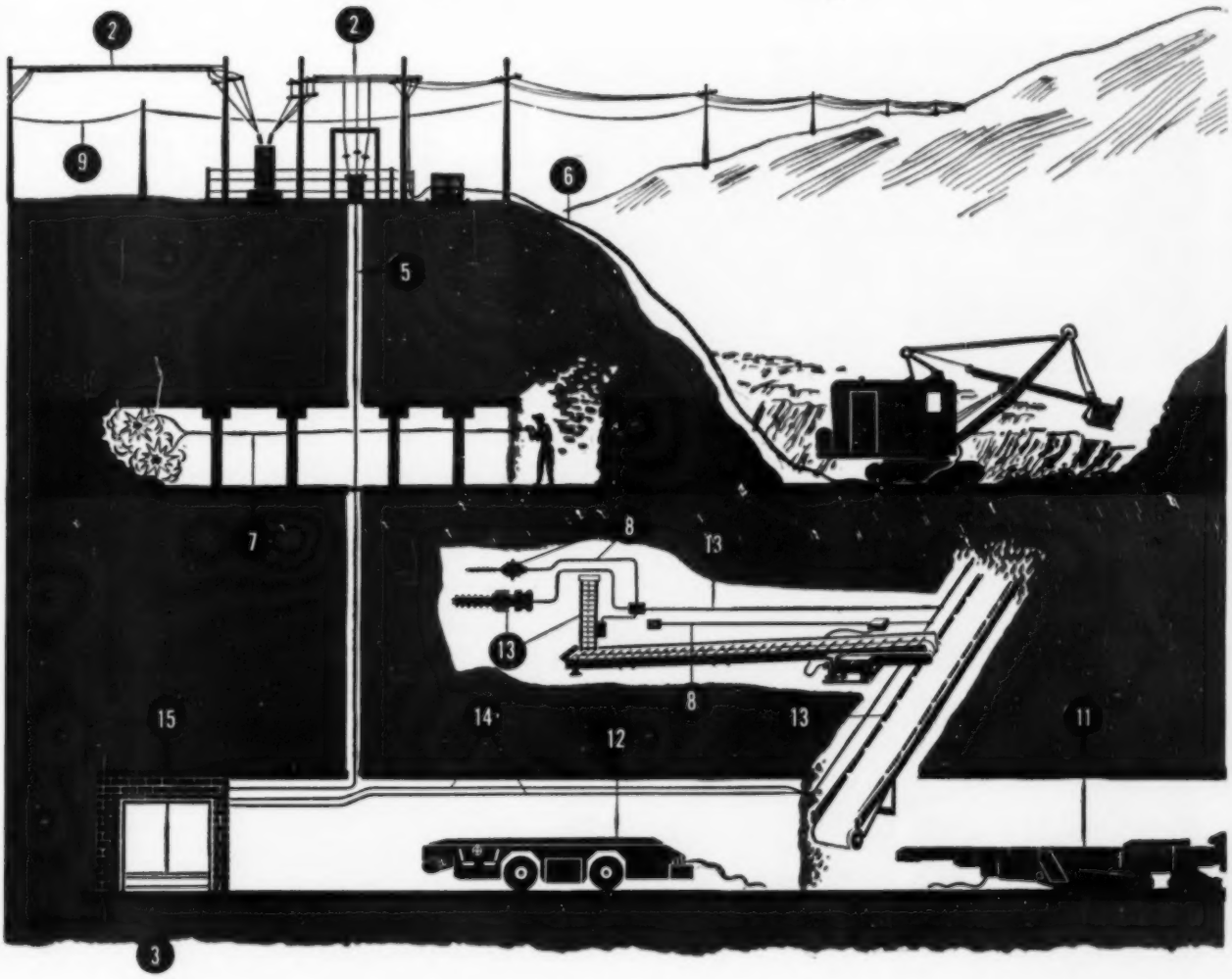
9. **TELEPHONE SYSTEMS** — Hazaprene Mine Telephone Wire, Exterior Type Weatherproof Braided, Exterior Type Hazaprene

10. **MINE LOCOMOTIVE (CABLE-REEL TYPE)**
Hazacord Single-Conductor, Hazacord Two-Conductor Concentric, Hazacord Twin Type W

11. **TRACK-MOUNTED, RUBBER-TIRED OR CATERPILLAR-MOUNTED MINING MACHINES** — Hazacord Two-Conductor Round or Twin Type W or G, Hazacord Three-Conductor Type W

LASTING, TROUBLE-FREE

throughout your mining operations



12 **SHUTTLE CARS (CABLE-REEL TYPE)** — Hazacord Two-Conductor Concentric, Hazacord Twin Type W or G

13 **MINE CONVEYOR EQUIPMENT** — Hazacord Two-Conductor Round or Twin Type W or G, Hazacord Three-Conductor Type W

14 **MINE POWER DISTRIBUTION (IN TUNNELS, SHAFTS, SLOPES AND DRIFTS)** — Hazasheath, Armortite, Parkway, Hazaprene, Spiralweave, Steel Armored, Self-Supporting

15 **UNDERGROUND SUBSTATIONS** Hazasheath, Armortite, Parkway, Hazaprene Wire

SAFER AND LONGER LASTING. Because they are engineered to meet the specialized requirements of the mining industry, Hazard Mining Cables have many advantages that pay off in more efficient and economical electrical service for you.

For example, Hazacords — protected with the tough, mold-cured, flame-resistant Hazaprene ZBF Sheath — are setting new standards of performance on portable and mobile equipment. New "locked-tight" construction of twin-type Hazacord prevents destructive internal slipping in high speed reeling applications. Flame-resisting Hazard Redshot Type RG is the only shot-firing cord made in the easy-to-separate, round, parallel form.

Whatever your electrical circuit problem may be, there is a service-proved Hazard cable design to answer it. Hazard's 72-page Mining Catalog gives you full details, or ask your Hazard representative. Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

HAZARD

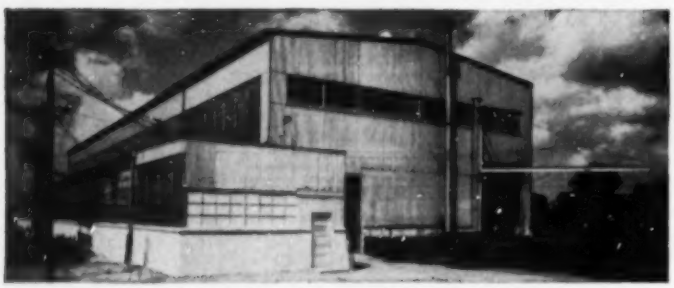
insulated wires and cables for every mining use

Make ROBERTS & SCHAEFER COMPANY Your Headquarters for Complete Engineering,

● **These are the R & S services and facilities available to you for your next engineering, fabricating and construction project—the whole job or any part of it, anytime you are ready.**

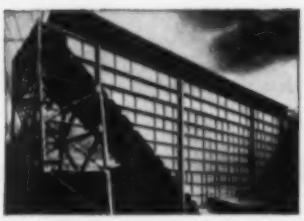
Engineering

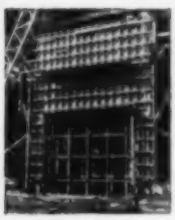
Plans move quickly in this engineering department . . . under the supervision of well-known specialists in the field of civil, mechanical, electrical and architectural design.



Fabricating

This modern, well-equipped, well-staffed plant has facilities for fabricating a wide variety of steel and machinery products—R & S preparation and handling equipment and scores of other critical items for your project. It helps us avoid delays which result from depending upon outside manufacturers.





Construction

R & S has long been known as headquarters for complete, functional coal preparation plants of all sizes and descriptions—whether of steel, concrete or timber construction.

Test before you invest!

This modern R & S pilot preparation plant lets you take the guess-work out of coal cleaning. Using a full carload sample, with full size equipment, under actual operating conditions, it shows exactly what R & S equipment can do for your coal product. At the end of the process all end products are analyzed by an outside, unbiased laboratory, Commercial Testing and Engineering Co. You get their full report in writing, plus the recommendations of R & S coal preparation specialists. The full story is told in a new bulletin. Write for your free copy.

ROBERTS and SCHAEFER CO.

120 NORTH WELLS STREET · CHICAGO 6, ILLINOIS

PITTSBURGH 22, PA., Henry W. Oliver Bldg. · BIRMINGHAM 18, ALA., P. O. Box 370

HOUSTON 25, TEX., 2800 M. Main St.

FOREIGN DEPARTMENT

International Mfg. & Equipment Co., Inc., 120 Broadway, New York 5, N. Y., U. S. A.

R & S AND COMPANY

Fabricating and Construction Service

—and Coal Show Service Too!

HELP ON PREPARATION PROBLEMS . . . *PLUS!*

Be sure to include R & S in your plans for the May 11-14 Cleveland Coal Show. In keeping with the R & S tradition of service and hospitality, we have designed our Coal Show booth for your *profit and pleasure.*

As always, the R & S booth will have a full time staff of R & S engineers to help you with your coal preparation and handling problems . . . to make your visit to the Coal Show as profitable as possible.

For your added profit, pleasure and convenience, R & S also invites you to take advantage of the other R & S booth services and facilities described here.

SECRETARIAL SERVICE

If you have to dash off a quick letter to your office, or any place else during the course of the Coal Show, chances are you can get exactly the kind of help you need at the R & S booth.

PLAN TO "HANG YOUR HAT" (literally) AT R & S SERVICE HEADQUARTERS

While space, hangers and racks last, we shall be happy to have you use the cloakroom facilities of the R & S service booth.

WHERE'S THE PHONE? AT BOOTH 2000, OF COURSE!

"Where's the telephone?" is usually a problem at trade shows and conventions. However, the 1953 Coal Show will be an exception. Feel free to use the telephone facilities provided at R & S booth 2000, "at the top of the stairs."

REST AND READ . . . OR VISIT

The central location of R & S booth 2000, "at the top of the stairs," makes it a good central point for starting out or ending up, for meeting friends, or for just plain relaxing in a soft, comfortable easy chair.

UP-TO-DATE DATA ON R & S EQUIPMENT AND SERVICES

Booth 2000 will have ample stocks of all up-to-date Roberts and Schaefer Co. literature. Your visit to the booth will be a good chance to bring your R & S literature file up to date.

AND "COFFEE-AND"

It's always "coffee-and" time at R & S Coal Show Service Headquarters "at the top of the stairs." We hope you will plan to stop and have a cup of coffee with us while you are at the Show. We will enjoy seeing you and we believe you will enjoy the "coffee-and."

We look forward to seeing you at the Cleveland Coal Show May 11-14, 1953

"AT THE TOP OF THE STAIRS"

ROBERTS and SCHAEFER CO.

BOOTH 2000

3 GRADES OF SELECTED DIAMONDS

2 IMPROVED TYPES OF CAST-METAL MATRICES

2 MODERN POWDERED METAL MATRICES

DOUBLE-TUBE REAMING SHELL

Available in all standard sizes for use with all types of double-tube corebarrels. Special sizes and types as required. Inserts are tough tungsten-alloy matrix set with carefully selected diamonds.

SINGLE-TUBE REAMING SHELL

Available in all standard sizes for use with all types of single-tube core barrels. Larger sizes and special designs as required. In order to fill orders promptly for either single- or double-tube reaming shells we must know the make and model of the core barrel.

CASING-SHOE BIT

Available in the same wide range of sizes and types as our standard casing bits and designed so that they can be left on the end of the casing in the hole while drilling is continued through them with the corresponding standard size of core barrel and bit.

STANDARD CASING BIT

Available in all standard sizes with a choice of four different matrices and three different grades of selected diamonds. Larger sizes and special designs furnished as required. Must be removed before continuing to drill with core barrel and bit.

STANDARD CORING BIT

Available in four different matrices and three different grades of correctly-sized diamonds, EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs furnished to meet any specifications or requirements.

IMPREGNATED CORING BIT

Especially suitable for drilling through hard, broken or extremely abrasive ground, where diamond loss from surface-set bits might be excessive. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs as required.

SERIES "M" CORING BIT

For use with Series "M" Double Tube Corebarrel as developed by Sprague & Henwood, Inc. to meet the need for a higher percentage of core recovery from soft, broken or friable material than can normally be obtained with a standard double-tube corebarrel. Available in all four types of matrix and three different grades of diamonds. Also in a complete range of "impregnated" type bits. EX, AX, BX and NX sizes carried in stock.

We KNOW What These Bits Can Do

Because Our Own Drilling Crews Use Them

For more than sixty years Sprague & Henwood, Inc. has been a leader in the field of Contract Diamond Drilling and our crews—operating throughout the United States and many other countries—have constituted the best possible "laboratory" for proving the quality of Sprague & Henwood bits. They demand the best and we can't afford to give them anything less.

As manufacturers, therefore, we are in the highly advantageous position of KNOWING the relative value of every Sprague & Henwood bit for any given drilling condition, from the performance records of our own crews. And this valuable information is passed on to bit purchasers without charge or reservation.

If you use diamond drilling bits we want you to have a free copy of our new Bulletin No. 320. Write for it today and tell us about your drilling conditions. Our experienced executives welcome opportunities to make money-saving recommendations.

CONTRACT CORE DRILLING

is a very important phase of our business. This includes exploratory drilling for coal and ore — also foundation testing for bridges, dams and other heavy structures. Experienced crews and supervisors are available for service anywhere in the United States and many other countries. Estimates submitted on request.

SPRAGUE & HENWOOD, INC. Scranton 2, Pa.

See our four-page insert in the McGraw-Hill Mining Catalogues

"CONCAVE" TYPE NON-CORING BIT

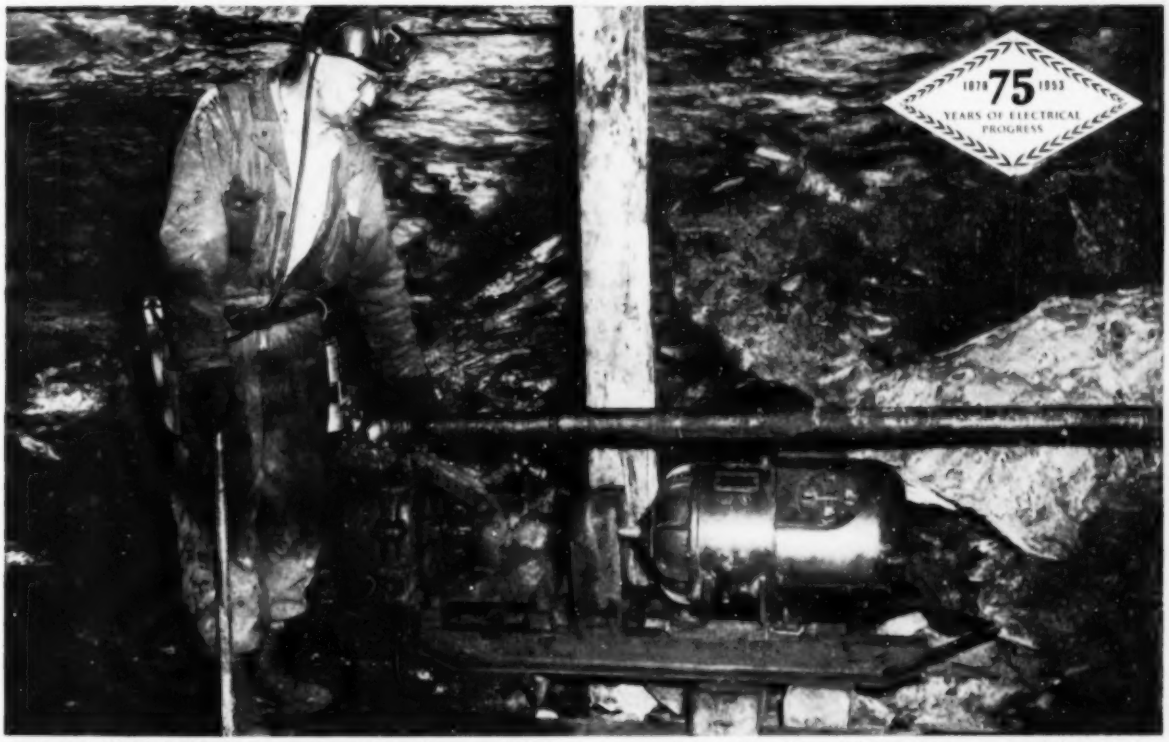
Especially suitable for drilling round smooth holes in relatively soft formations, when cores are not required. All standard sizes available in four different types of matrix.

"PILOT" TYPE NON-CORING BIT

Recommended for drilling blast holes in hard formations and also for use when long straight holes must be drilled in variable formations.

"TAPER" TYPE NON-CORING BIT

The fastest cutting bit for drilling blast holes in very hard formations. All standard sizes.



NEW G-E MINE MOTORS are now serving a large coal producing company in the Pocahontas coal fields. Ten are used to drive gathering pumps close to the working face, as shown here, where they pick up mine water and deposit it in a large sump. G-E mine motors resist corrosive mine water and coal dust, last longer in mining service.

New motor easily maintained in mine

TWO-STUD BRUSH CONSTRUCTION permits locating all brushes on one half of commutator—makes them easy to reach through two large hand holes instead of four.

G-E mine motor permits checking brushes, changing cable, without dismantling motor

You'll find all the features wanted most by mining men in General Electric's new totally enclosed d-c mine motor:

Easier to maintain No need to take motor apart or off your machine. Two-stud construction makes all brushes easier to reach. Removable cable gland permits easy cable replacement if necessary.

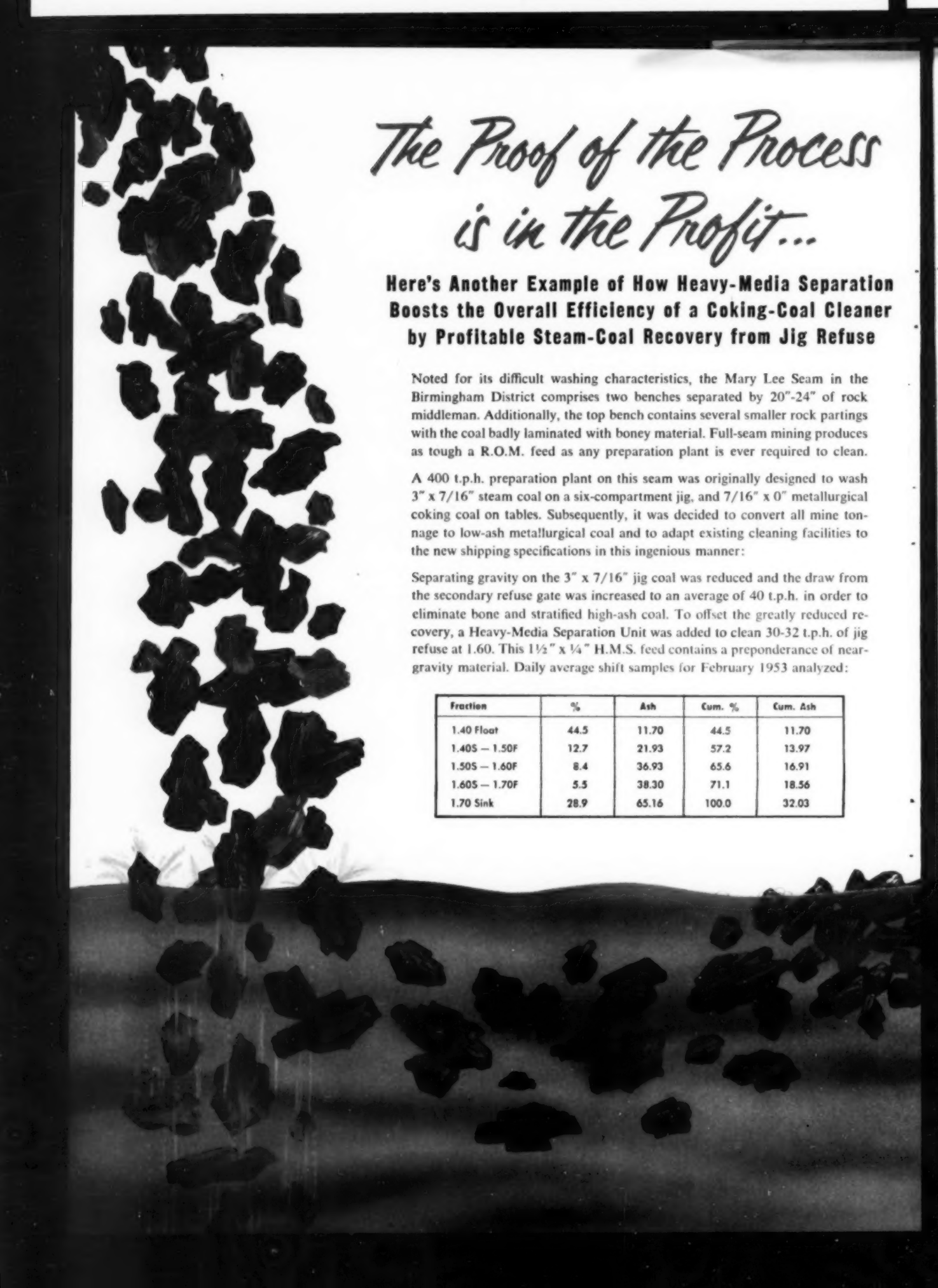
Longer-lasting Corrosive mine water and coal dust won't harm it, thanks to cast-iron end shields and heavy rolled-steel magnet frame.

Easier to install Fits in minimum mining-machine space because no part extends beyond this compact motor's normal width.

Whether you buy or build mining machines, learn more about this new G-E motor. Ask your G-E Apparatus Sales representative, or write for Bulletin GEA-5553 to General Electric Co., Sect. 663-34, Schenectady, N. Y.

You can put your confidence in—

GENERAL ELECTRIC



The Proof of the Process is in the Profit...

Here's Another Example of How Heavy-Media Separation Boosts the Overall Efficiency of a Coking-Coal Cleaner by Profitable Steam-Coal Recovery from Jig Refuse

Noted for its difficult washing characteristics, the Mary Lee Seam in the Birmingham District comprises two benches separated by 20"-24" of rock middleman. Additionally, the top bench contains several smaller rock partings with the coal badly laminated with boney material. Full-seam mining produces as tough a R.O.M. feed as any preparation plant is ever required to clean.

A 400 t.p.h. preparation plant on this seam was originally designed to wash 3" x 7/16" steam coal on a six-compartment jig, and 7/16" x 0" metallurgical coking coal on tables. Subsequently, it was decided to convert all mine tonnage to low-ash metallurgical coal and to adapt existing cleaning facilities to the new shipping specifications in this ingenious manner:

Separating gravity on the 3" x 7/16" jig coal was reduced and the draw from the secondary refuse gate was increased to an average of 40 t.p.h. in order to eliminate bone and stratified high-ash coal. To offset the greatly reduced recovery, a Heavy-Media Separation Unit was added to clean 30-32 t.p.h. of jig refuse at 1.60. This 1½" x ¼" H.M.S. feed contains a preponderance of near-gravity material. Daily average shift samples for February 1953 analyzed:

Fraction	%	Ash	Cum. %	Cum. Ash
1.40 Float	44.5	11.70	44.5	11.70
1.40S — 1.50F	12.7	21.93	57.2	13.97
1.50S — 1.60F	8.4	36.93	65.6	16.91
1.60S — 1.70F	5.5	38.30	71.1	18.56
1.70 Sink	28.9	65.16	100.0	32.03

How efficiently and profitably does Heavy-Media Separation clean this exceedingly difficult feed? Study these typical results:

	Theoretical*	Plant
Recovery	65.6%	64.4%
Coal Ash (1.60 float)	16.91%	16.29%
1.60 sink in coal	—	1.4
1.60 sink ash	—	32.85
Refuse Ash (1.60 Sink)	60.87%	60.4%
1.60 float in refuse	—	1.7
1.60 float ash	—	31.35

*Calculated from feed

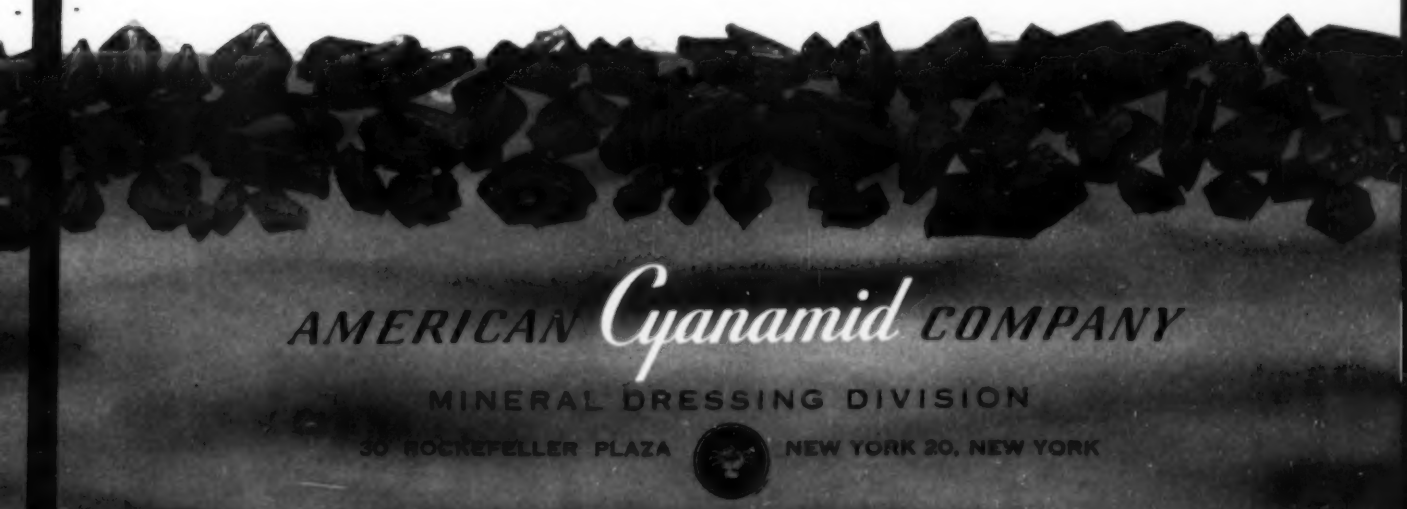
Note that misplaced material averaged less than 1.5%. Note that operating efficiency is 98+% of theoretical perfection. Note also that the H.M.S. Unit recovers over 20 t.p.h. of steam coal with a medium consumption of only 0.78 lb. per ton of feed. Equally important, the H.M.S. unit insures consistent low-ash jig coal by allowing removal of sufficient secondary middling to act as a "flywheel" to compensate variations in quality and quantity of jig feed.

Here is clear-cut evidence of how overall recovery, efficiency and profit can be increased by adding Heavy-Media Separation Unit to an existing mechanical cleaning plant. Obviously, if Heavy-Media Separation can operate so efficiently and profitably on difficult jig refuse and middlings, it can be even more profitable on an average run-of-mine feed. In case after case, the record shows that Heavy-Media Separation recovers 5% or more shipping coal from the same feed.

Why be satisfied with less than maximum recovery from the coal you dig, load, haul and feed to your cleaners? Why settle for less than maximum profit? Remember there never has been and never will be "something for nothing". Lower first-cost mechanical cleaners or modifications of true Heavy-Media Separation cannot achieve ±0.01 accuracy of separation inherent in true Heavy-Media Separation.

Pre-fabricated Heavy-Media Separation plants to handle from 50 to 300 t.p.h. are available for prompt installation. Larger plants can be designed and erected by several experienced engineering-construction firms.

Whatever size plant you require, Cyanamid will be happy to help you with facts and figures and to cooperate with engineers of your choice on its design. Your request for specific information will have prompt attention from a nearby Cyanamid Field Engineer.



AMERICAN Cyanamid COMPANY

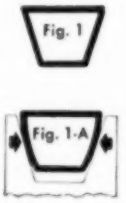
MINERAL DRESSING DIVISION

30 ROCKEFELLER PLAZA NEW YORK 20, NEW YORK

WHY
Gates V-Belts Wear Longer-

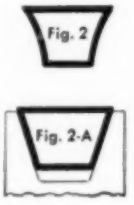
The CONCAVE SIDE (U.S. Patent No. 1813698) is what gives the Extra Wear!

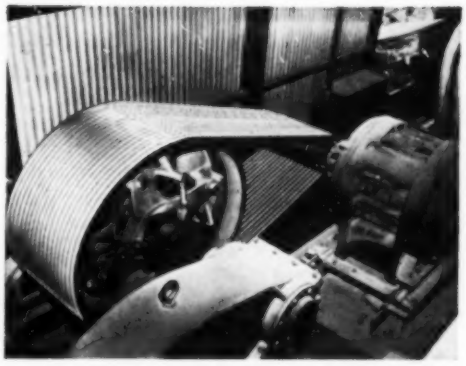
Take any *straight-sided* V-Belt (Fig. 1) and bend it as it bends in going around its pulley. You will clearly see its sides *bulge out* (Fig. 1-A). These sides therefore press *unevenly* against the V-pulley and this causes extra wear at the point shown by arrows (Fig. 1-A).



Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2).

You will see the precisely engineered CONCAVE SIDES fill out to an exact fit in the sheave-groove (Fig. 2-A). The sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the Gates Vulco Rope—and this means longer belt *life* and *lower* belt *costs* for you.





Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE SIDES—the Gates Vulco Rope!

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

CS-533

V-Belts — Hose
Molded Rubber Goods
for Industry
World's Largest Maker
of V-Belts

Gates® VULCO ROPE DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

CUT COAL HAULING COSTS

with the NEW ★ HOLZWORTH ALUMINUM SHAKER CONVEYOR

EASY TO ADAPT
Can be adapted to your present system. Drive secured and adapter section attached.

EASY TO ASSEMBLE
Minimum of parts, functional design. Laying in of "I" beam from drive.

EASY TO DISASSEMBLE
To disassemble 108 feet of pan line, only 12 bolts need to be removed.

1 HAULS TWICE AS MUCH COAL
as ordinary conveyors

2 HAULS COAL TWICE AS FAR

● Frontier Bronze Corporation announces the new, modern shaker conveyor that grows as your operation grows. The Holzworth Aluminum Shaker Conveyor *cuts cost* of time and labor, gives you speedier hauling, and requires little maintenance or additional equipment. By hauling twice the coal twice as far, it gives you more profit per ton. Moreover, the aluminum construction makes it light and easy to handle. Its unique design enables fast set-ups in the heart of your operational area, or when operations switch to new locations.

An outside demonstration proved how speedily Aluminum Shaker Conveyor can be set-up in another area of operation. Total moving-up time of 165 feet required less than half an hour.

SPECIAL FEATURES

● Frontier Bronze Corporation provides an adapter for the system you are now using, enabling you to hook your present steel pans to the Holzworth pan line. Thus, you can install the Holzworth Aluminum Shaker Conveyor gradually if you wish.

Multiple Hauling — You can haul coal from as many as four different rooms at one time, with one drive by use of Bell Crank. By using second drive, coal can be hauled 1000 feet.

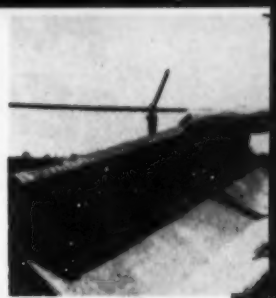
NEW PRINCIPLE

● With this newer, more efficient shaker conveyor, the shaking motion is transmitted from the rails to individual aluminum pans; the shock which moves the pans along is not on the pans themselves but on the carrier rails. This results in much faster hauling than ordinary conveyors.

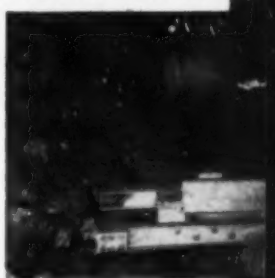
Only replacement cost is for aluminum pans which cost less than present pans.

Pictures illustrate six important efficiency features of the Holzworth Aluminum Shaker Conveyor.

LEARN ALL ABOUT THE NEW HOLZWORTH ALUMINUM SHAKER CONVEYOR AT THE MAY COAL-MINING SHOW IN CLEVELAND. COMPLETE INFORMATION WILL BE AVAILABLE AT THE SHOW. BE SURE TO INSPECT IT AT BOOTH 336.



EASY TO HANDLE
Present rail transmission sections weigh about 180 lbs.; stands only 50 lbs.



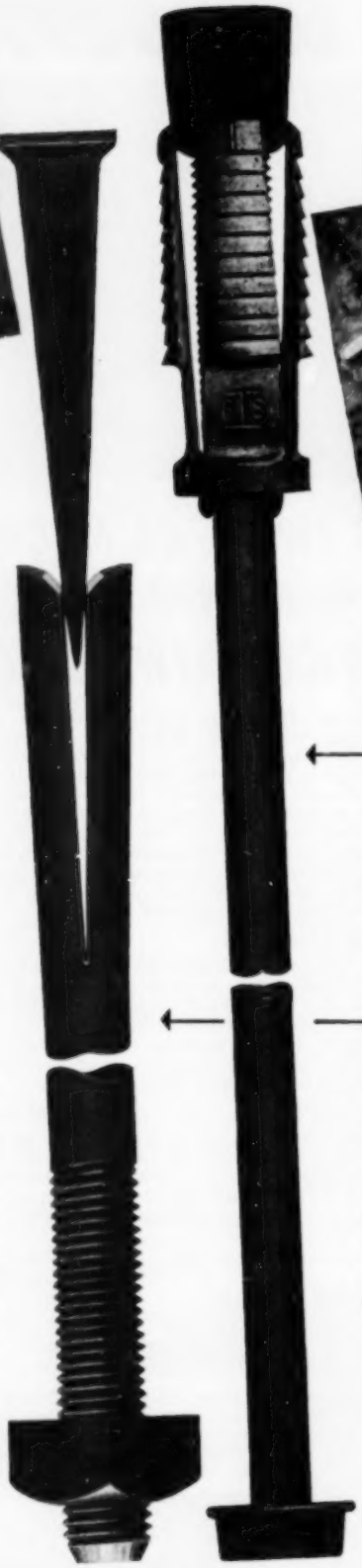
EASY TO USE
Conveyor can be set up right in mine face, saving time, labor, handling.

EASY TO OPERATE
Continuous trouble free operation, hauling more coal faster — farther.

FRONTIER BRONZE CORPORATION

4888 PACKARD ROAD, NIAGARA FALLS, NEW YORK

FOR GREATER SAFETY USE ROOF BOLTS



Where the safety of workers is concerned, it pays to use roof bolting. Roof bolts do much to eliminate the danger of accidents caused by roof falls because they virtually lock the roof in place by consolidating layers of strata into a thick, single-unit beam.

Roof bolting has other important advantages. It increases the operating efficiency of the mine by eliminating timber supports. It makes possible improved ventilation, faster haulage, wider mine openings, and larger areas in which to manipulate mechanized equipment.

All these conditions can be obtained by using Bethlehem Roof Bolts. These bolts are made from new-billet steel in lengths of from 2 ft to 8 ft, and in the two types illustrated. Each type has its place, depending largely on the type of roof encountered. The bolts can be used vertically or at angles. For complete information, write to us at Bethlehem, Pa.

←SQUARE HEAD ROOF BOLT

For 1⅝-in. hole. Comes with expansion shell. Rolled-thread bolt has unchamfered head. Pressed ears on shank support shell during anchoring. When bolt is tightened, plug expands leaves of expansion shell to provide holding pressure. Leaves lock against sides of hole to prevent shell from turning during installation.

←SLOTTED ROOF BOLT

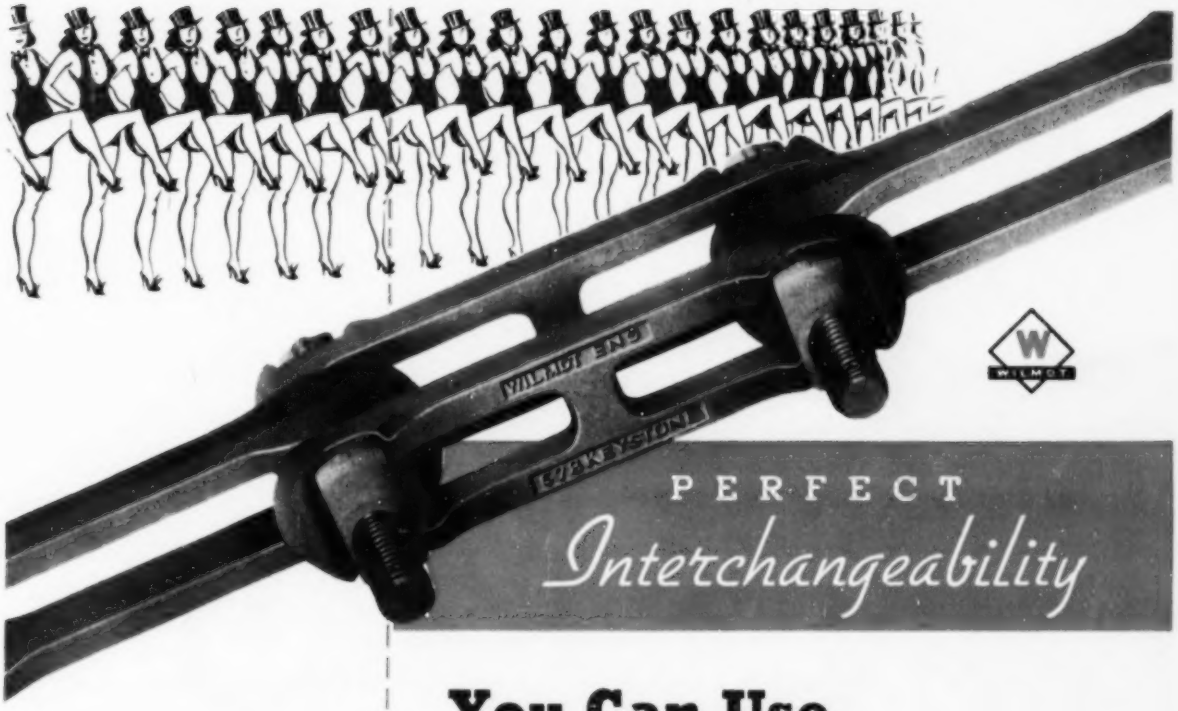
For 1¼-in. hole. Forged slot accommodates steel wedge. Slot is automatically centered, forms equivalent of two half-rounds. Opposite end of bolt has 5 in. of 1-in. rolled threads. When driven into hole, wedge penetrates slot, expanding bolt-ends. Has truncated-cone point to prevent thread damage. Fitted with American Standard Regular Square Nut.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM MINE ROOF BOLTS



PERFECT

Interchangeability

You Can Use Wilmot Rivetless Chain for Any Replacement

Here are three ways Wilmot is enabling an increasing number of leading firms to simplify conveyor maintenance and to cut inventories of spare parts:- (1) Wilmot chain of any given size number will interchange with the same number of any other chain. (2) As the originators of rivetless chain, Wilmot offers the largest choice of chain sizes available. Chain furnished in pitches from 3" to 10½" and in working loads from 3,000 to 130,000 lbs., of drop-forged steel, alloy or cast chrome-manganese. (3) Wilmot has, or will design, everything for your conveyor from drive to take-up. For instance, in the Wilmot catalog of rivetless chain conveyors, pictured here, you will find by far the largest listing of chain attachments. They are furnished in malleable iron, drop-forged steel and cast carbon or alloy steels. Let us show you how you can simplify conveyor maintenance, shorten "down" time, as well as economize on spare parts by depending on Wilmot for all replacements.

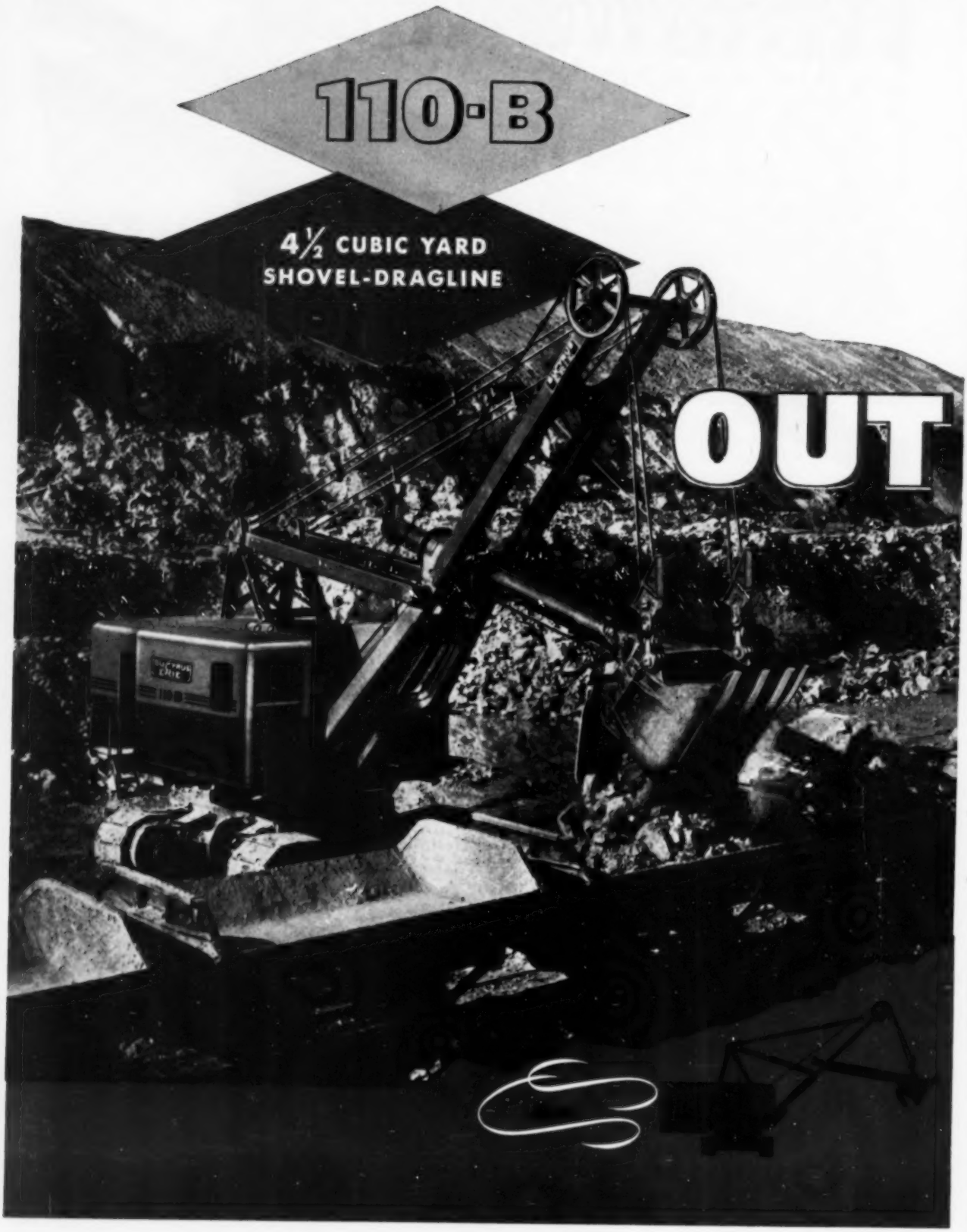
Send for 248-page book on Chain, and Conveyors

MAY 11-14
WE HOPE TO HAVE THE PLEASURE OF MEETING YOU AT THE CLEVELAND COAL SHOW

WE'LL DEMONSTRATE
Everything for Your Conveyor
IN OUR EXHIBIT AT BOOTHS 2404-6

WILMOT ENGINEERING CO.

HAZLETON, PA.
Plant:
WHITE HAVEN, PA.


110-B
4½ CUBIC YARD
SHOVEL-DRAGLINE
OUT

another slugger in the PUT lineup

Now — taking its place in the outstanding line of Bucyrus-Erie heavy-duty quarry and mine excavators is the field-proved 4½-yard 110-B — a convertible shovel-dragline which can give you bigger output in coal or overburden at lower cost than any other machine of like capacity on the market today.

Like the larger 150-B (6-yard) and 190-B (8-yard) machines, the 110-B features Bucyrus-Erie's exclusive shovel front-end. The strong, light two-section boom reduces weight and speeds digging cycle, yet provides ample strength for tough digging. Tubular dipper handle, free to rotate in saddle block, permits digging with one corner of dipper without introducing torsional strains. Powerful effective rope crowd reduces swing inertia because crowd machinery is located on revolving frame. And, twin dual hoist ropes concentrate power where needed to pull dipper through toughest banks.

Before you buy any machine in the 4½-yard range, investigate the 110-B. It will give you consistently large output at lowest cost per yard. For detailed information, write today for Bulletin 110-B-1. 29L53C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

AT THE COAL SHOW
CLEVELAND, May 11-14

visit Booth 332 and see the 150-B electric shovel model in operation.

You'll get maximum lump coal

WITH DU PONT "MONOBEL" AA

Monobel® AA is widely used because it delivers coal that mine foremen are glad to see... firm and coarse. It does an excellent job in hard-shooting seams; and its high density, combined with low velocity, produces a heaving action that evenly shears both ribs and back ... putting the coal within easy reach so that it is no problem for mechanical loaders to handle. Ideal for either top or bottom cutting.

The water-resistant characteristics of "Monobel" AA are another reason why it is the preferred permissible in wet mines. It creates little smoke, has good fumes and allows quick return to the working place.

Try "Monobel" AA in your own mine. It has aided many operators to increase output. Perhaps it can do the same for you. Any Du Pont Explosives representative will gladly give you complete information about this popular permissible and help with any blasting problem you may have. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Del.

Plan to visit Du Pont in Booth 207 at the 1953 American Mining Congress Coal Show, May 11-14 — Public Auditorium, Cleveland, Ohio.

DU PONT PERMISSIBLES

Blasting Supplies and Accessories

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ... *THROUGH CHEMISTRY*

Swing-motion ... tells time

The swing of the old pendulum has marked time for generations and gained lasting fame for its precision.

19401

Swing-motion ... Saves time

Among this generation of mining men, Goodman's swing-motion loaders have won a reputation for saving time by speeding production with cost-saving tonnages per shift.

Let us arrange for you to visit a mine and watch a Goodman swing-motion loader in action. You will see the difference.

The Swing is to Goodman Loaders

4 TYPES, 4 SIZES: ALL SWING-MOTION

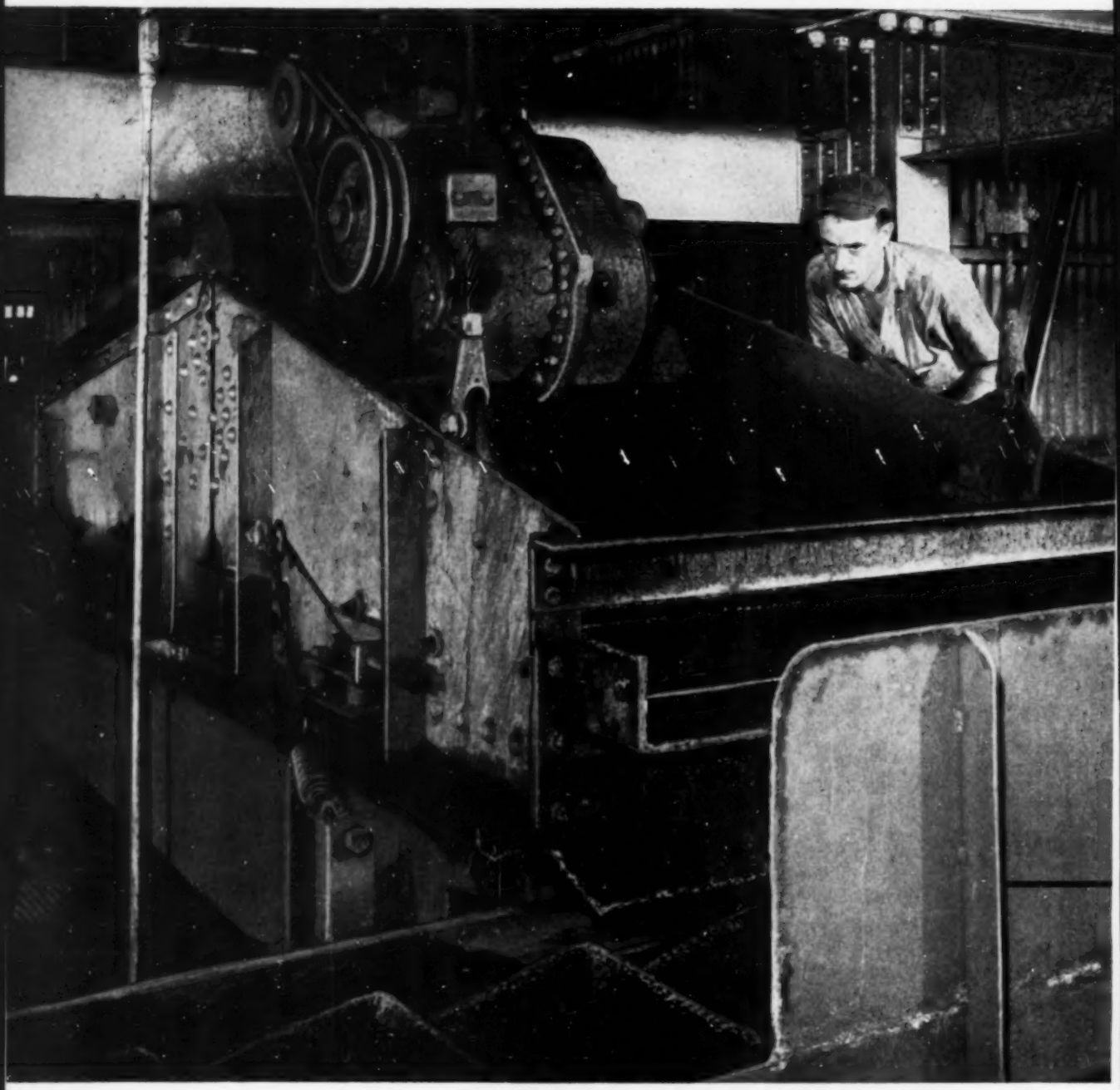
TYPE	TRAMMING HEIGHT
665	41½ inches
666	36½ inches
660	33 inches
865	26½ inches

Goodman
MANUFACTURING COMPANY
4834 S. Halsted Street • Chicago 9, Illinois

***AVAILABLE NOW** . . . a Data Sheet covering the Goodman line of swing-motion loaders. A copy is yours for the asking.*

Cutting Machines · Conveyors · Loaders · Shuttle Cars · Locomotives · Continuous Miners

INTEGRATED



Allis-Chalmers vibrating screens are available in three basic types in a complete size range with modifications of each type. Applications include sizing dry or moist coal, dewatering, sink-float, heavy media pre-wetting and recovery, sludge screening.

Thermo-Deck, Tenrope and Vari-Pitch are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

equipment...

IMPROVES COAL QUALITY
CUTS PROCESSING COSTS
INCREASES TONNAGE!

Upgrading coal to meet the requirements of today's big markets in metallurgical, chemical and power industries calls for the coordination of equipment best suited for each processing operation. Only through the teamwork of integrated equipment can you get these benefits:

- **Maximum efficiency of men and machines.**
- **Important processing economies.**
- **Big production increases.**

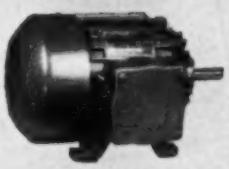
Largest of any manufacturer in range of industrial equipment, Allis-Chalmers offers a broad choice of equipment types and sizes. This means that Allis-Chalmers can make a truly *unbiased* recommendation for each job. It also means coordinated research and engineering and the right-for-the-job integration of machine, motor, drive and control . . . integration that produces more and better coal . . . integration that affords the obvious advantages of total responsibility for overall operation.

Allis-Chalmers field engineers are equipment application specialists. They work with your staff . . . appraise your equipment needs expertly. For the complete profit-building story of integrated equipment, call on your nearby A-C representative or write for Bulletin 25B-6280D. Allis-Chalmers, Milwaukee 1, Wis.

A-4036

MACHINE–MOTOR–DRIVE–CONTROL

THE CW SOLIDS HANDLING PUMP — Especially designed for coal washing. Handles up to 40% solids in suspension in slurries, tailings and sludges. Only five easily removed working parts. Capacities from 175 to 10,000 gpm; heads to 150 feet.



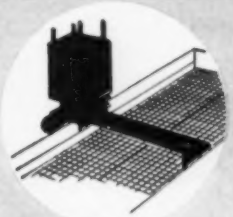
MOTORS — Allis-Chalmers builds a complete line of polyphase squirrel cage, wound rotor and synchronous motors with electrical and mechanical modifications to meet any application.

TEXROPE* DRIVE** — ***Vari-Pitch standard sheave. One sheave does the job of two or three. Speed range of 9% to 28% on drives of 1 to 300 hp. Two to ten grooves. Available in either motion or stationary control.

CONTROL — Includes full and reduced voltage starters for all type motors from fractional to 2500 hp, operating on voltage from 110 to 5000. Starters are available in general and special purpose enclosures.

TRANSFORMERS— Simple design, substantial construction and care in manufacture all contribute to excellent, long term "on-the-line" performance with minimum maintenance. A-C makes transformers of all types for indoor and outdoor installation.

CAR SHAKER — Unloads gondola cars in as little as two minutes. Simple vibrating mechanism is eccentric shaft mounted on large bearings and driven by a 15 hp motor and *Texrope* drive inside shaker body.



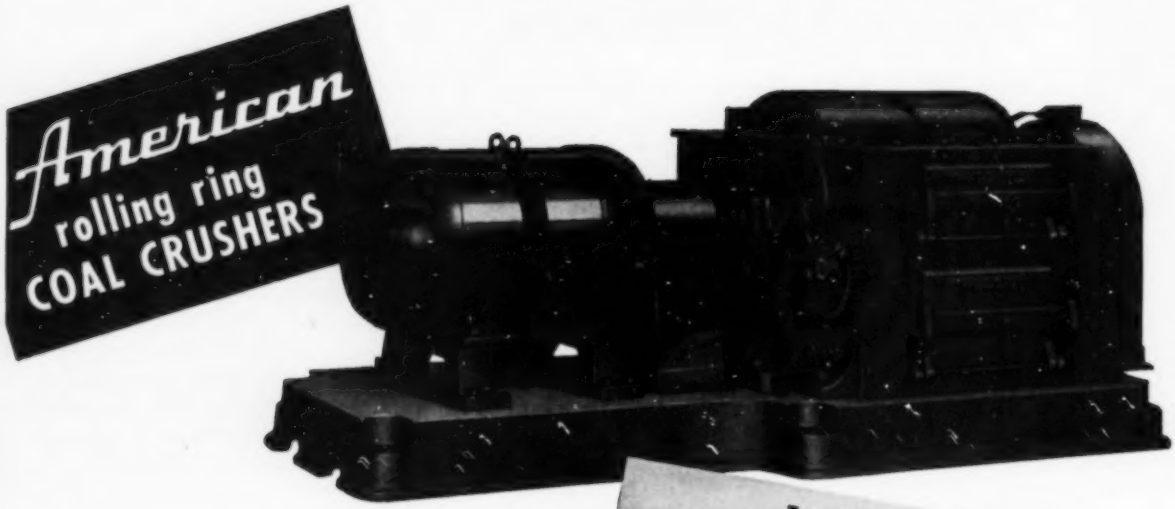
THERMO-DECK Heating Unit — Low voltage resistance heating of wire cloth eliminates troublesome blinding of moist fine coal. Can be installed on any A-C screen.

Allis-Chalmers is one of the few companies in the world that can equip your plant with the basic machinery plus power, electrical and control equipment needed to operate it — *integrated equipment from a single source backed by complete responsibility.*

See the ALLIS-CHALMERS Integrated Line at the Coal Show. May 11-14, Public Auditorium, Cleveland, Ohio

CRUSHING UNLIMITED!

the story of 61,000,000 tons of coal crushed at less than 1¢ per ton!



The facts are in! The story of American Crusher performance—rugged, long-life-low-cost performance—is now available for your careful study. Not just one case history, or scattered reports—but a thorough survey of American installations (power plants, central stations, and mines) across the nation. Here are the "crushing" facts:

Total Tonnage Handled .....61,000,000 Tons
Average Age of Crushers .....9.5 Years
Replacement Parts (Including Standby Parts)
1/10 of 1¢ per Ton

There can be no better proof of American's superlative endurance and economy of operation!

Typical Survey Results

LOCATION	CRUSHER	TONNAGE	PARTS REPLACEMENT COST
N. J. Central Station	42-S	6,000,000 Tons	$.00025 per ton. 20-year-old installation!
W. Va. Industrial Power Plant	38-S	10,008,000 Tons	$.0008 per ton. 10 years in service!
Illinois Coal Mine	AC3-E	4,000,000 Tons	$.0005 per ton for 10 years service!
W. Va Coal Mine	38-S	2,514,000 Tons	$.0007 per ton. 23 years old!
Ill. Power Plant	42-S	2,950,000 Tons	$.0004 per ton. 6 years in service.

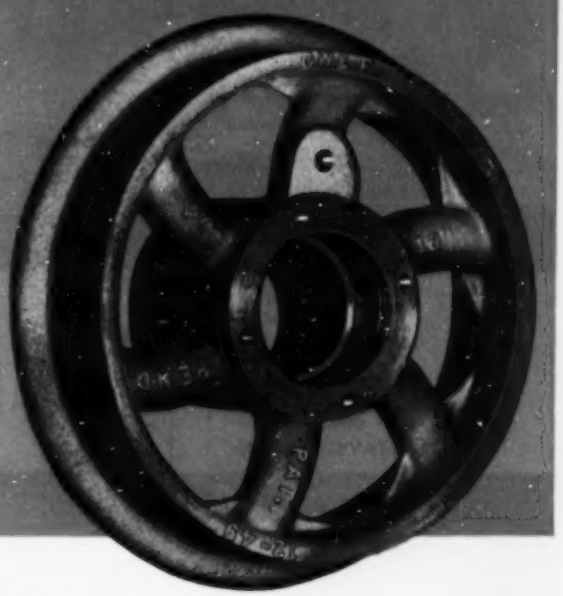
WRITE today for your copy of "Crushing Coal at Less Than 1¢ Per Ton"

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave.
St. Louis 10, Mo.

Positive protection against profit loss- when you use sterling CAST STEEL WHEELS



LESS WEAR ON CARS AND TRACKS

Sterling's exclusive balanced design cast *steel* wheels reduce vibration, prevent costly wear and tear on tracks and cars alike.

GREATER MILEAGE, LOWER OPERATING COSTS

Sterling cast *steel* wheels are precision engineered to give you far smoother transportation, greater mileage at less cost.

LOWER REPLACEMENT COST

Although Sterling cast *steel* wheels cost more than other types your *replacement* cost is actually *lowered* when you use the money-saving Sterling re-wheeling plan.

LESS DOWN TIME: REDUCED LABOR COST

Sterling cast *steel* wheels work-harden with each trip. This extreme hardness is uniform *throughout* tread and flange, assuring much longer life than other type wheels.

Transportation breakdowns can not only be expensive, but hazardous. A crushed wheel, derailed cars, a smashed locomotive can take the profit out of *any* mining operation. That's why STERLING STEEL CASTING COMPANY developed the exclusive balanced-design cast *steel* wheel, an engineering masterpiece that is your best assurance for dependable, low maintenance, trouble-free transportation. Aside from the great safety factor, in the long run Sterling cast *steel* wheels actually cost you *less* than any other type of wheel on the market today.

For complete information on the Sterling Plan, *a time-tested program for re-wheeling that will put you dollars ahead for years to come . . .*

mail this coupon today!

sterling
STEEL CASTING COMPANY
EAST ST. LOUIS • ILLINOIS

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SALT LAKE CITY, UTAH
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Service Supply Co.
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Hawley Building

STERLING STEEL CASTING COMPANY
East St. Louis, Illinois

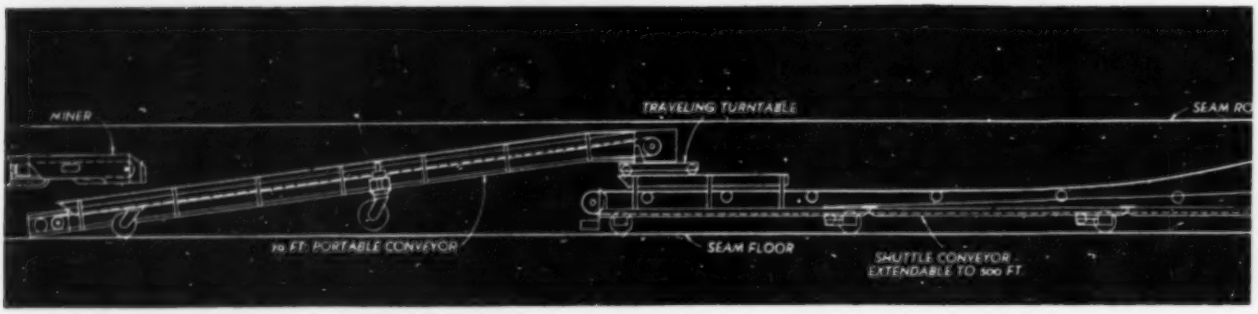
Please send complete information on the STERLING CAST-STEEL WHEEL REPLACEMENT PLAN to me immediately.

Name.....

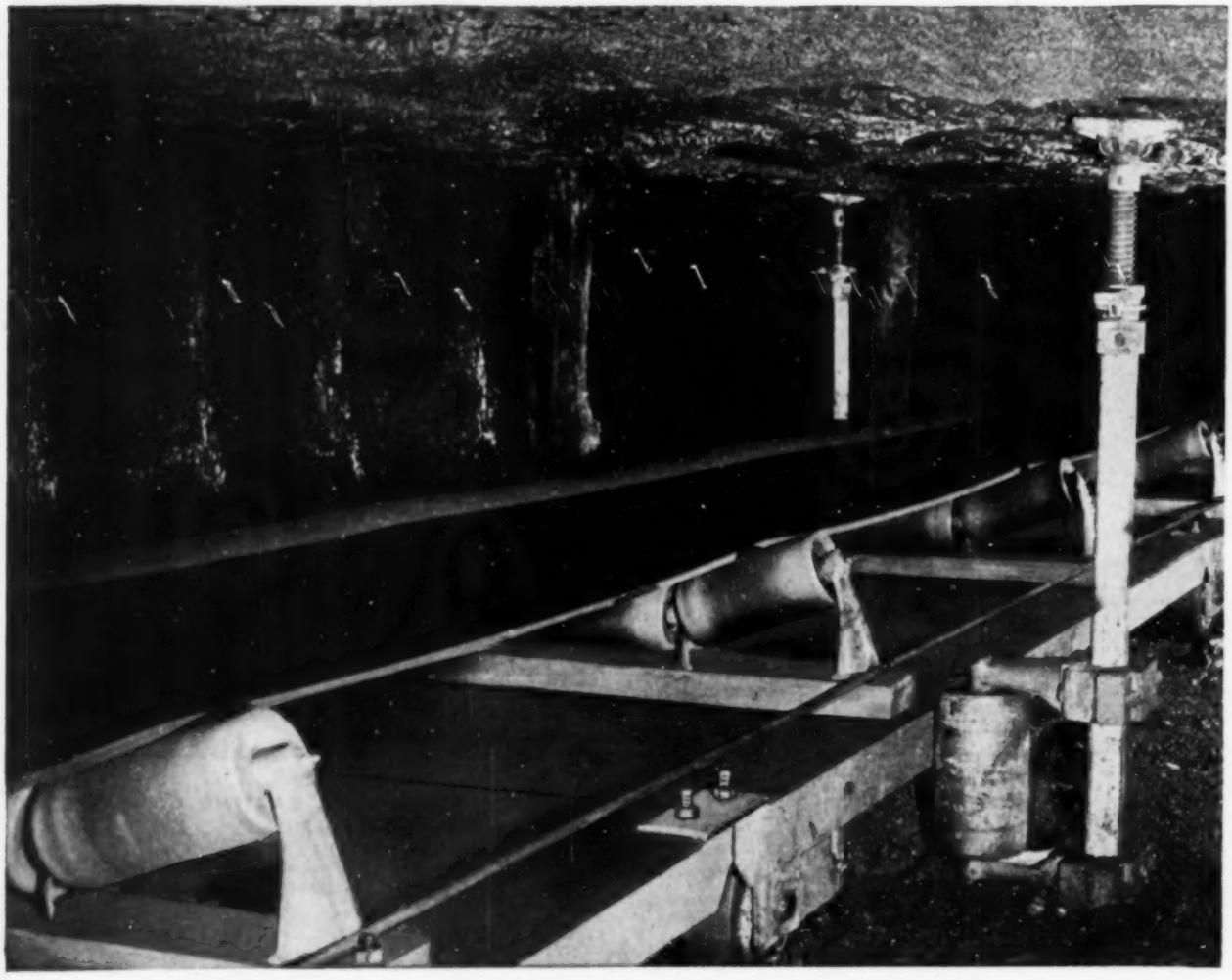
Company.....

Address.....

State.....



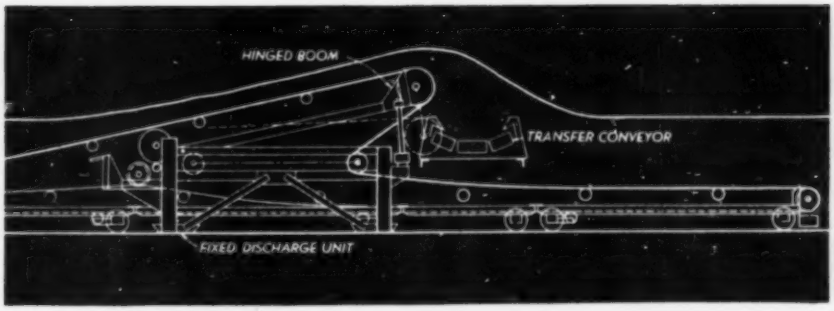
See This New Answer to



HEWITT-ROBINS INCORPORATED

HEWITT-ROBINS

DIVISIONS: HEWITT RUBBER • ROBINS CONVEYORS • ROBINS ENGINEERS



Continuous Mining

Don't Miss The Hewitt-Robins Mine Type Shuttle Conveyor In Action

On Display In The Main Exhibit Hall At The Coal Show— Booths 700, 714, 718 & 720

Now, for the first time, you can see the Hewitt-Robins Mine Type Shuttle Conveyor with fixed tripper in actual operation at the Coal Show in Cleveland, May 11th-14th.

Learn how this remarkable unit provides the key to truly continuous mining from face to preparation plant . . . provides a belt conveyor unit that is both extendable and retractable—can follow the progress of mining and at the same time maintain a fixed transfer point through a fixed tripper.

Discover how the Hewitt-Robins Mine Type Shuttle Conveyor forms the final link in a complete belt conveyor system that can handle an uninterrupted flow of coal directly from the face as fast as any mechanism can produce it.

When it comes to any type of belt conveyor system for coal handling anywhere . . . in the mine, on the slope, overland or in the preparation plant . . . only one company can assume single and unified responsibility for successful operation. Only Hewitt-Robins can provide —from within its own corporate structure—every element of successful belt conveyor performance including designing and engineering, manufacture of *both* belting and machinery and complete installation.

CHECK FOR INFORMATION ABOUT THESE JOB-TESTED PRODUCTS FOR YOUR OPERATION

CONVEYORS:
- ☐ —Belt
- ☐ —Dock
- ☐ —Mine
- ☐ —Shuttle
- ☐ —Slope
- ☐ —Vibrating
- ☐ —Fixed Tripper Shuttle

BELTING:
- *☐ —Elevator
- *☐ —General
- *☐ —Hot Materials
- *☐ —Raynile®
- *☐ —Steel Wrapper
- *☐ —Transmission
- ☐ —Woven Wire

☐ **BUCKET ELEVATORS**

☐ **IDLERS**

SCREEN CLOTH:
- ☐ —Electrically Heated
- ☐ —General

VIBRATING SCREENS:
- ☐ —Dewaterizers
- ☐ —General
- ☐ —Heavy-Duty Scalpers
- ☐ —Heavy Media

HOSE:
- *☐ —Acid
- *☐ —Air
- *☐ —Air Drill
- *☐ —Fire
- *☐ —Pinch Valve
- *☐ —Servall®
- *☐ —Steam
- *☐ —Twin-Weld®
- *☐ —Water
- *☐ —Water Suction
- *☐ —Flexible Rubber Pipe

☐ **MECHANICAL FEEDERS**

☐ **STACKERS**

☐ **CAR SHAKEOUTS**

☐ **TRIPPERS**

☐ **BELT CLEANERS**

*☐ **GROOVED PULLEY LAGGING**

☐ **CRUSHERS**

☐ **PICKING TABLES**

☐ **LOADING BOOMS**

☐ **RUBBERLOKT® BRUSHES**

☐ **MOLDED RUBBER PRODUCTS**

☐ **DESIGN AND CONSTRUCTION OF COMPLETE MATERIALS HANDLING SYSTEMS**

*For immediate information about these industrial rubber products, call your Hewitt Rubber Distributor (See "Rubber Products" Classified Phone Book.)

Hewitt-Robins Incorporated
666 Glenbrook Road
Stamford, Connecticut

NAME _____

TITLE & COMPANY _____

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735

INCORPORATED

RESTFOAM® • EXECUTIVE OFFICES: STAMFORD, CONNECTICUT

Again Outstanding DESIGN for New Speed and Economy in Drilling

Parmanco

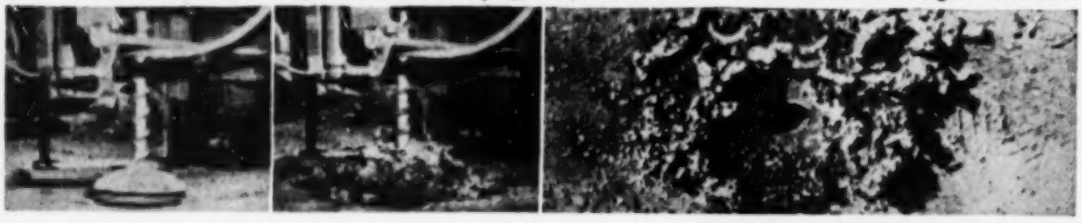
MODEL 51 • SELF-PROPELLED • HYDRAULIC

COAL AND CLAY DRILL

This Model 51, one-man operated drill, adds another unit to the top performing PARMANCO line of drilling machines.

An example of its great value is seen in its ability to drill 2½-inch holes at a speed up to 7 feet per minute in No. 5 coal. It will also handle 4¼-inch augers up to 25 feet in depth.

• Hydraulic Feed • Finger-Tip Controlled • Fluid Motor for Auger Rotation



4 Jacks and Power Winch optional at extra cost.

Above

New Automatic CUTTINGS SHIELD and GUIDE

Model 51 is equipped with the newly perfected Automatic Drill-Cuttings Shield and Guide. Now blast holes are kept absolutely clean from cuttings. Note in picture how a dam is formed about the blast hole, excluding casual surface water.

Looking down on New Automatic Drill-Cuttings Shield and Guide located at the right of driver's seat.

Send for Complete Details

PARIS MANUFACTURING COMPANY • PARIS, ILLINOIS

ROCK RATED

with Built-In features to save you money

MODEL 1055 — 3½ yards
MODEL 955A — 2½ yards

Strength was no afterthought on this husky machine. It started on the drawing boards — with all-welded construction of tough rolled steels — with extra strength where strength is needed — with the ability to absorb continuous shock loads . . . and the stability to let you use full power for bigger production. It is the steady digging, without time-outs for pampering, that saves you money.

Add smooth hydraulic control to cushion operations and reduce operating fatigue, and you have the built-in advantages to make all kinds of rock work more profitable. The Model 1055 (3½ yard) and the Model 955-A (2½ yard) have proved it. Ask to see one on the job.

P&H MAGNETORQUE*

ELECTRIC SWING

gives you the slickest, fastest cycle you've ever known on machines of this size . . . from 15% to 25% faster than any others! And there are no delays for adjustments or replacement of swing frictions. Magnetorque eliminates all that — and lasts the life of your machine.

**T.M. of Harnischfeger Corporation for electro-magnetic type coupling.*

P&H LARGE EXCAVATOR DIVISION
HARNISCHFEGER CORPORATION
MILWAUKEE 46, WISCONSIN

VISIT THE P&H EXHIBIT AT THE COAL SHOW—BOOTHS 2002, 2004, 2006, 2008.

the P&H Line

TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

Wire Rope at Work—As you draw near New York City at the northern end of the 118-mile New Jersey Turnpike, this is the bridge that carries you high above the Passaic River. The picture, taken at a time when the bridge was near completion, shows two 146-ton girders for the main span being lifted simultaneously into place by Bethlehem Wire Rope.

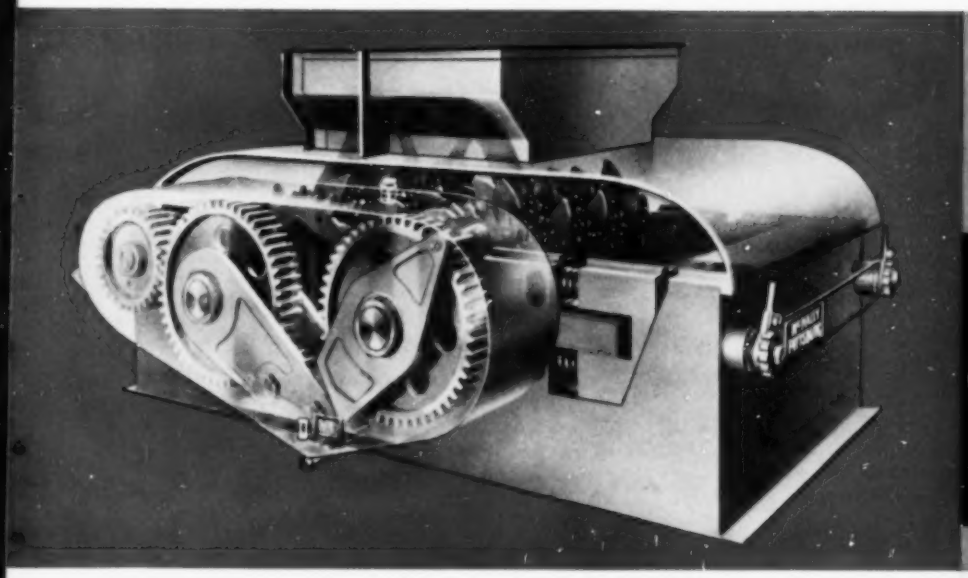
These heavy steel girders made a tough lift, but no tougher than thousands of others entrusted to Bethlehem rope all over the country. Wherever there are heavy lifting or hauling jobs to be done, you will find Bethlehem rope right in the thick of things, hard at work. You will always know it by the black-and-yellow reel, the reel that tells you, "Here a good product is in service."

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

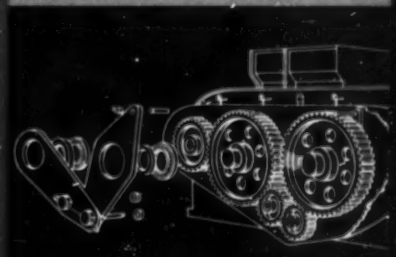
Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

Profits Start

with PROPER *PRIMARY Breaking...



*McNALLY GEARMATIC DOUBLE ROLL BREAKERS



HERE ARE THE FACTORS TO CONSIDER:

1. *Characteristics of your coal feed*
2. *Variations in size of finished product desired*
3. *Volume of each of these sizes*

This heavy duty equipment is used in the primary breaking process. By eliminating excessive large lump from run-of-mine you automatically reduce maintenance on your preparation equipment. Lump no bills become a thing of the past. These breakers handle tonnages ranging from 750 to 1400 TPH, and three sizes are available.

A primary feature of the Gearmatic Breaker is its ability to reduce lumps without producing excessive fines. The specially designed crushing segment teeth hit the lump coal with a splitting action. The result is that the lumps break apart freely without grinding off an excessive amount of small particles. No need to synchronize rolls when changing product size.

Efficiency in your primary breaker reflects itself in the amount of degradation that can be prevented at this first stage in processing.

YOU ARE CORDIALLY INVITED TO OUR BOOTH 1016 MINING CONGRESS EXHIBIT

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corp. • Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio Engineering & Sales Offices: Pittsburgh • Chicago • Rio de Janeiro Pittsburg, Kansas • Wellston, Ohio

DETACH AND MAIL THIS CARD

TELL US YOUR CRUSHING PROBLEMS

We'll help you solve them!

INFORMATION REQUIRED FOR MAKING CRUSHER RECOMMENDATIONS

1. Will the unit be used for run-of-mine breaking ( ) secondary reduction ( ) stoker coal sizing ( ) or middlings crushing ( )
2. Tons-per-hour feed ( )
3. Method of feeding crusher—type feeder ( ) or conveyor ( )
4. Feed size range ( )
5. Maximum size lump ( )
6. Size of product wanted ( )
7. Is coal hard ( ) medium ( ) or soft ( )
8. What percentage of oversize is allowable ( )
9. Whether or not oversize is recirculated through crusher (yes) (no)
10. Power characteristics (voltage, phase, and cycle) ( )
11. Bore and keyseat length of motor shaft ( )
12. Motor make and frame number ( )

NAME & TITLE_____

COMPANY_____

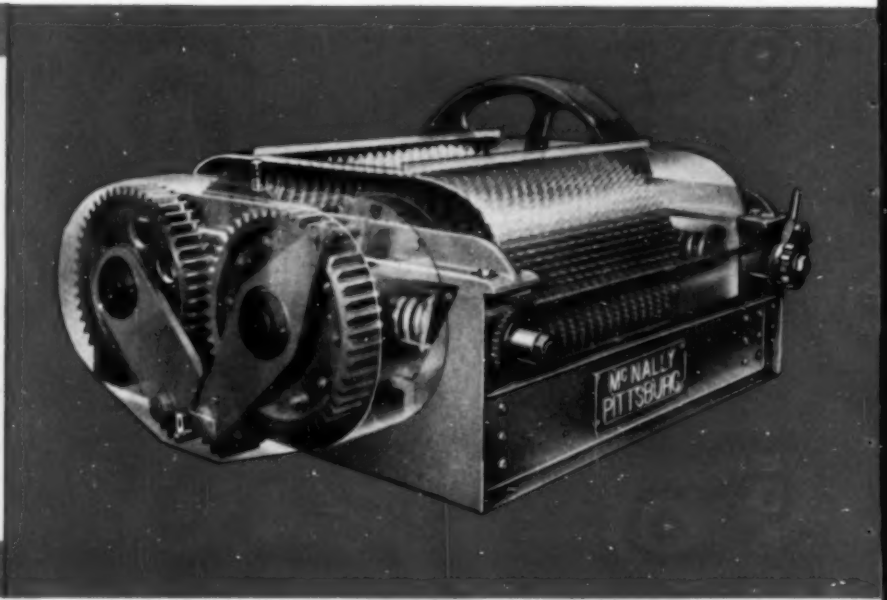
STREET_____

CITY & STATE_____

88 GEARMATIC STOKER COAL CRUSHERS INSTALLED IN 6 YEARS • How's that for popularity?

- PROVEN ACCEPTANCE
- LESS DEGRADATION
- LOW MAINTENANCE
- ADJUSTMENT WHILE IN MOTION

Make the Gearmatic America's Outstanding Crusher Buy



2 SIZES—HEAVY DUTY and STANDARD DUTY

The McNally Pittsburg Gearmatic Stoker Coal Crusher offers three prime advantages in stoker coal crushing:

1. *High volume production* 2. *Accurate sizing* 3. *Low percentage of fines*

Two factors make for its success:

FIRST is the interlocking tooth segmental crushing roll.

SECOND is the full-floating Gearmatic Drive, with gears running in oil for constant lubrication.

The cone-shaped teeth are staggered to give an interlocking mesh. As the segment rolls revolve, the teeth pierce and split the coal. The result is a minimum production of fines. Crusher Bulletin 151 furnishes complete data and range of sizes.

McNALLY PITTSBURG

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

McNally Pittsburg Manufacturing Corporation • Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio • Engineering & Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

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PERMIT No. 93
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TELL US YOUR CRUSHING PROBLEMS

We'll help you solve them!

for dependable — low cost

POWER CONVERSION

LEWIS

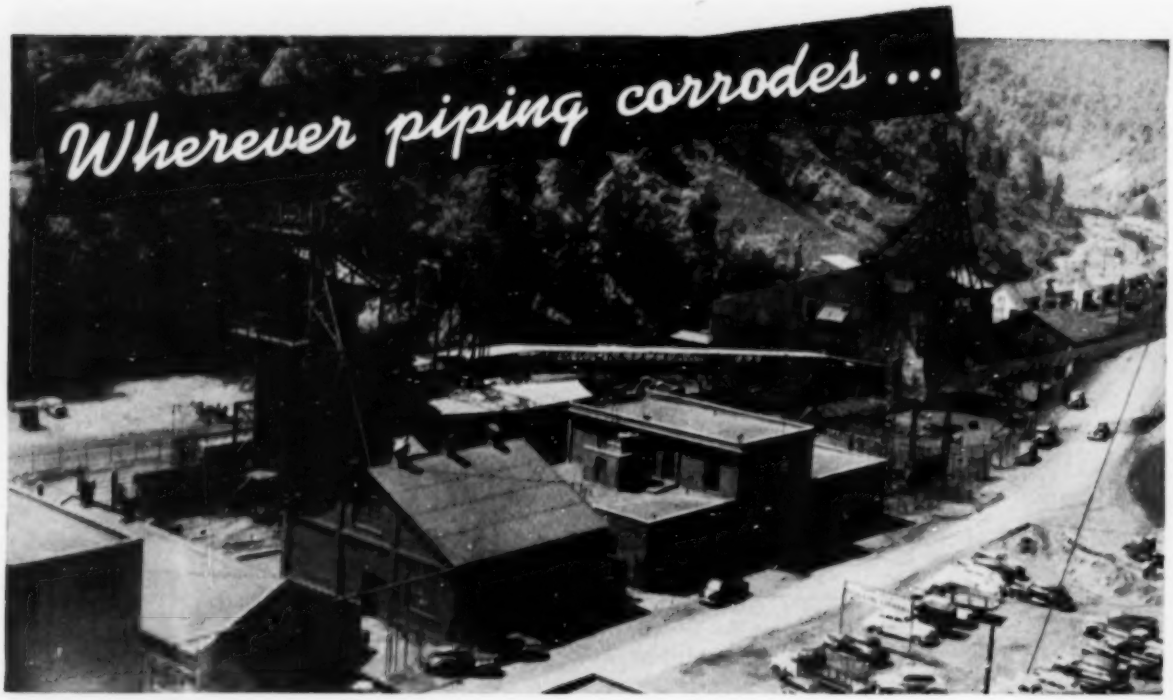
Selenium Rectifiers

Tough, compact, dependable . . . LEWIS mine type selenium rectifiers are definitely the answer to economical power conversion in underground or surface operations . . . where efficiency is most important.

By precise, specialized manufacturing craftsmanship LEWIS presents *higher than rated* quality rectifiers . . . consider these points: EASY TO MAINTAIN—no moving parts except for forced draft fans which require oiling once a year. UNATTENDED OPERATION—equipped with automatic over-load protective devices. INSTANTANEOUS DC POWER—no warmup period; power available on closing AC input circuit. HIGH OVER-LOAD PEAKS—Selenium plates can handle peak over-loads to 1000% of normal. LONG LIFE—many still operating after 8 years at full capacity.

See us at the
COAL SHOW
May 11-14
or write for catalog

LEWIS ELECTRICAL MFG. CO.
580 WHITTIER ST. • NEW YORK 59, N. Y.
Pittsburgh Representative: S. E. Gane Co.



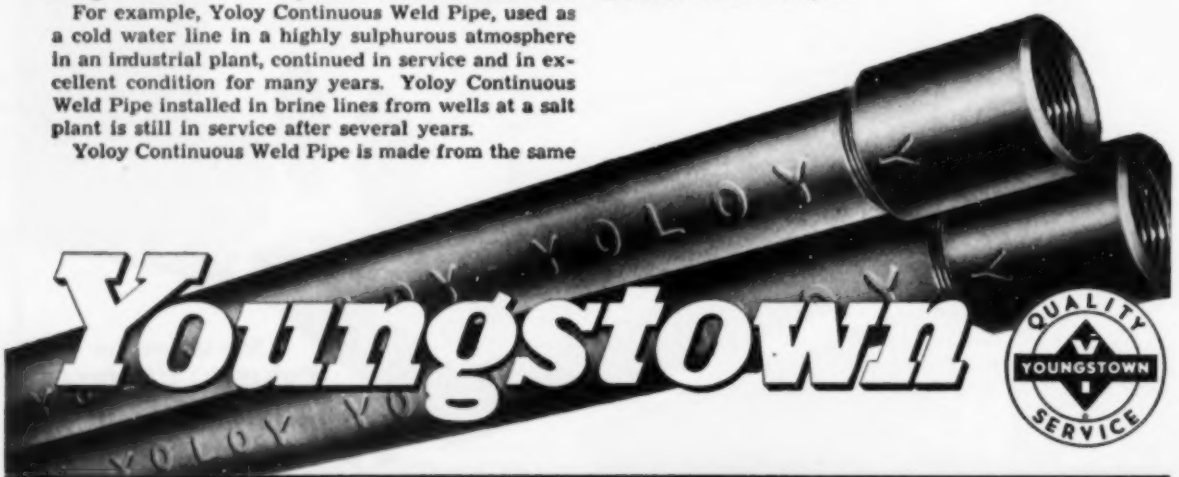
use YOLOY continuous weld pipe

Yoloy Continuous Weld Pipe offers distinct advantages for use in mines and industry where replacements due to corrosion are frequent. In addition, its use is recommended wherever piping is concealed—in commercial buildings, schools and residences.

In standard tests Yoloy steel has demonstrated that its resistance to atmospheric corrosion is four to six times greater than that of regular steels. In actual installations Yoloy Pipe has demonstrated that it has a high resistance to many other corrosive conditions.

For example, Yoloy Continuous Weld Pipe, used as a cold water line in a highly sulphurous atmosphere in an industrial plant, continued in service and in excellent condition for many years. Yoloy Continuous Weld Pipe installed in brine lines from wells at a salt plant is still in service after several years.

Yoloy Continuous Weld Pipe is made from the same nickel-copper steel composition that has proved so successful in service in the oil, mining, railroad, chemical, trucking and other industries where resistance to corrosion and abrasion is of prime importance. This pipe is easy to thread and fabricate with standard pipe tools. It can be electric or gas welded readily. It has high strength and high resistance to abrasion, shock and vibration fatigue. For further information, write or phone the Youngstown District Sales Office nearest you.



Youngstown

QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices - Youngstown 1, Ohio

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Export Office - 500 Fifth Avenue, New York

COLD FINISHED CARBON AND ALLOY BARS - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES

Cutting a KERF in Your Undercutting Costs

Mobile mining equipment demands more stamina from a portable cable than almost any other service. Cables attached to these underground mining machines are dragged over rough edges of coal and yanked around the sharp corners of pillars and entries. Only a long-life, cured-in-lead cable like TIREX has the stamina to resist the abrasion, tension strains and general rough usage encountered in this service.

Simplex-TIREX Cables are used as original equipment by many mining machine manufacturers because of the freedom from cable failure. That's just about the finest testimonial a product can get.

If you expect quality, economy and dependability from the cables you use, then be sure they are marked "Simplex-TIREX." They slash maintenance and postpone the day of cable replacement.

● *More complete information may be obtained from your nearest Simplex distributor or by writing to the address below.*

Simplex WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 Sidney St., Cambridge, Mass.

RECOVER COAL FINES

WITH EIMCO AGIDISC

Eimco Agidisc filters are heavy-duty, dependable machines built for continuous 24 hour operation in dewatering fine coal.

These filters will:

1. Reduce moisture contents in the fine coal to 15% or better, depending on the other plant equipment.

2. Produce a clear filtrate which contains less than the allowable ppm solids permitted under existing anti-pollution laws.

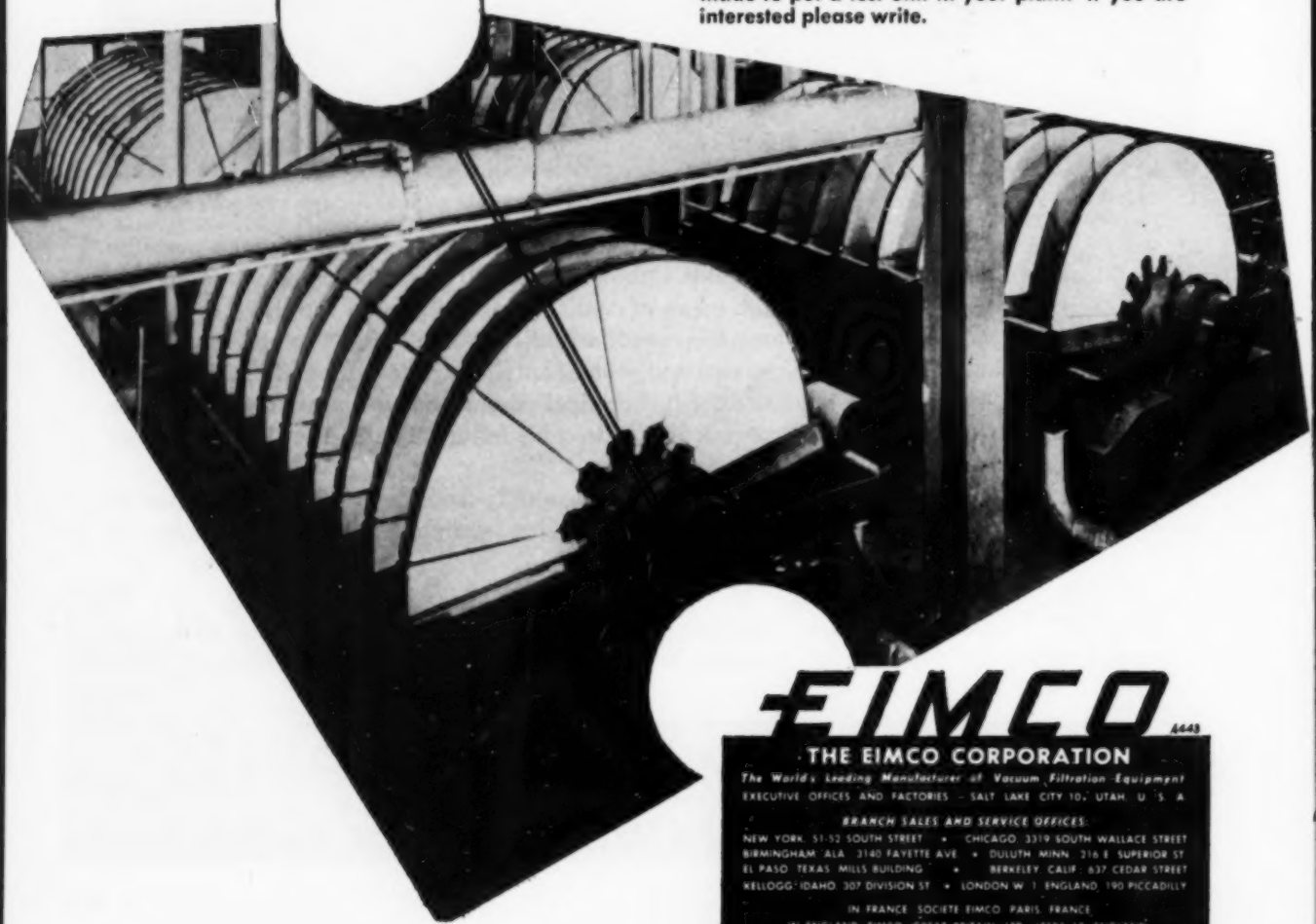
3. Permits uniform cake distribution over the entire surface of the disc with a resultant even drying of the fine coal filter cake.

4. Produces greater tonnage of dewatered coal per square foot of filter surface.

5. Save a product that has been considered too expensive to process — providing additional profits per ton of coal washed.

6. Pay for itself in a very few months.

Eimco Agidisc filters are doing an outstanding job in many coal washing plants and coal pond reclamation projects. Arrangements can be made to put a test unit in your plant. If you are interested please write.



EIMCO 4443

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The World's Leading Manufacturer of Vacuum Filtration Equipment

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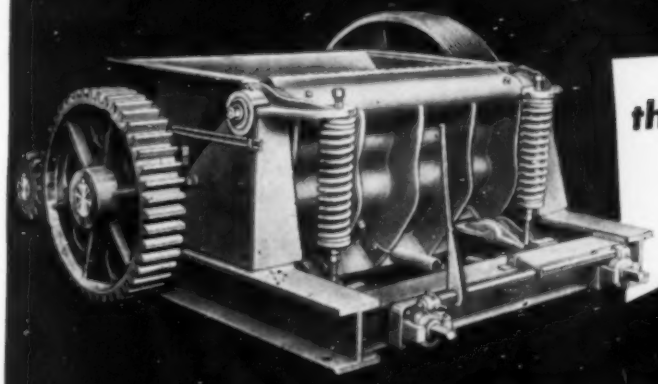
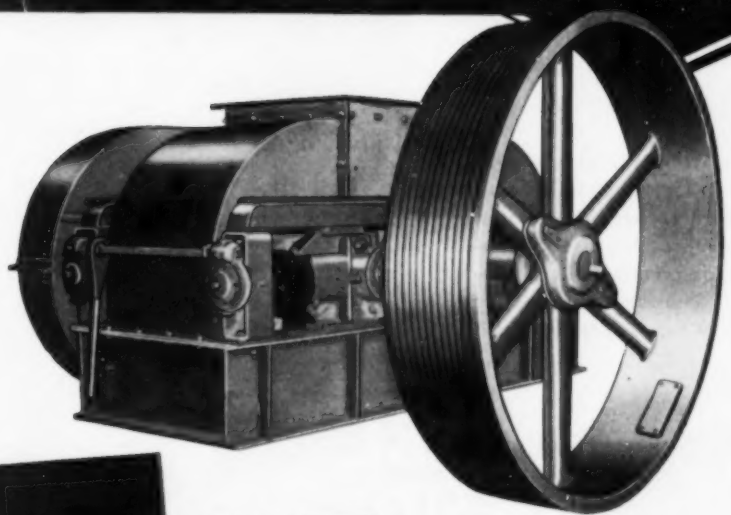


the EFFICIENT ECONOMICAL and PRACTICAL WAY

McLANAHAN

Single and Double Roll

BLACK DIAMOND CRUSHERS



Used extensively throughout the anthracite and bituminous coal fields, these dependable McLanahan Black Diamond Crushers crack large or small lumps of coal or other materials to desired size with a minimum of fines. These machines are the answer to your coal crushing problems, and are built to handle high tonnages. Available in numerous sizes and types, these single and double roll crushers are constructed of steel, semi-steel, or fabricated steel, with babbitt or bronze bearings for a long life of satisfactory service.

Write Today
for Bulletin
BD-457

McLANAHAN & STONE CORPORATION
Pit, Mine and Quarry Equipment Headquarters Since 1835
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Dependable Products: Single and Double Roll—and Jaw Crushers, Crushing Plants, Reciprocating Plate and Apron Feeders, Roll Grizzlies, Conveyors, Elevators, Screens, Scrubbers, Steel Log Washers, Sand Drags, Hoists, Jigs, Dry Pans, Dryers, Scrap Bundlers, Pulleys, Gears, Bearings, Sprockets, Sheaves, Rollers, Bin Gates, Elevator Buckets, Gratings, Car Wheels, Ferrous and Bronze Castings.

Your equipment gets

TOUGH

when you install

J&L JALLOY HEAT-TREATED PLATE

for impact and abrasion resistance on equipment like this

J&L Jalloy Heat-Treated Plate—the mining and quarrying steel—can help you cut maintenance costs, increase the service life of equipment that takes a real beating from severe impact and abrasion.

Here's why—heat-treated Jalloy was developed by J&L specifically for heavy duty applications such as those encountered in the mining and quarrying field. It's a heat-treated, fine-grain, manganese molybdenum steel with both yield strength and Brinell hardness *4 times* as great as mild steel. The result—J&L heat-treated Jalloy *lasts 4 times as long as mild steel* yet costs only twice as much.

It's easy to see why more and more progressive equipment owners have turned to J&L heat-treated Jalloy to do a dollar-saving job for them. If you're responsible for the economical operation of earth moving or handling equipment you'll want complete information on this modern mining and quarrying steel. Just fill in the coupon for a free copy of our Jalloy Booklet—"For Longer Wear . . . Less Repair."

W-3059

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH

J&L STEEL

Jones & Laughlin Steel Corporation
411 Liberty Avenue
Pittsburgh 30, Pennsylvania

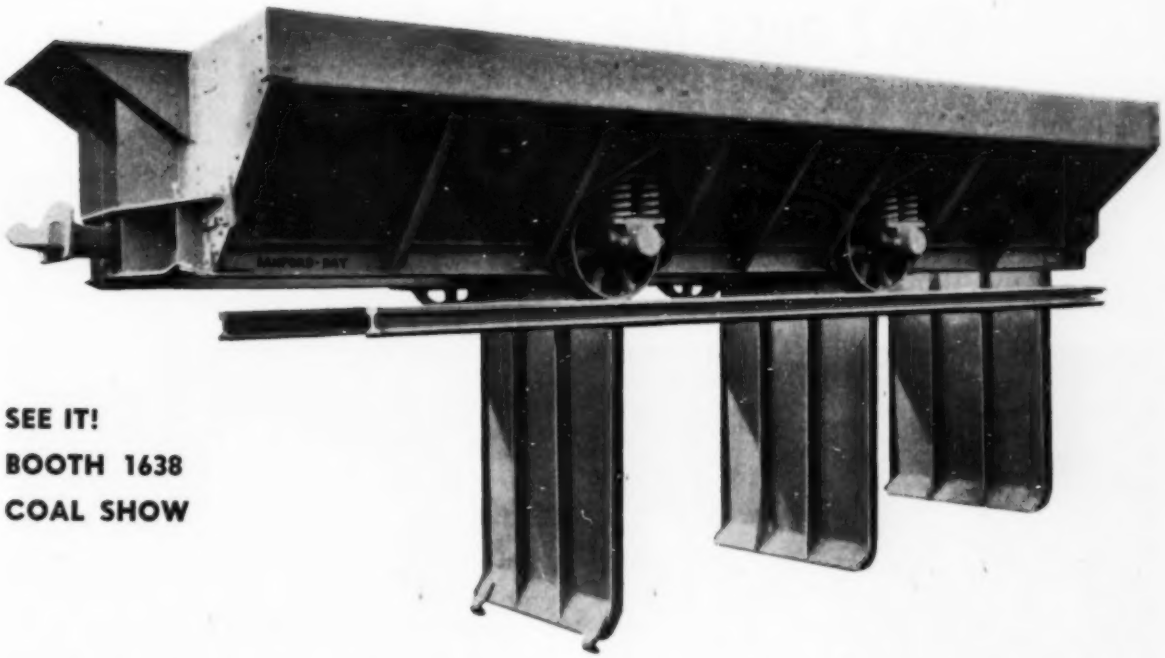
☐ Please send me a free copy of your booklet—"For Longer Wear . . . Less Repair."
☐ Please have your representative call.

Name _____ Title _____

Company _____

Address _____

New Uniontown Coal Co. Mine Car On Display at Mining Congress . . .

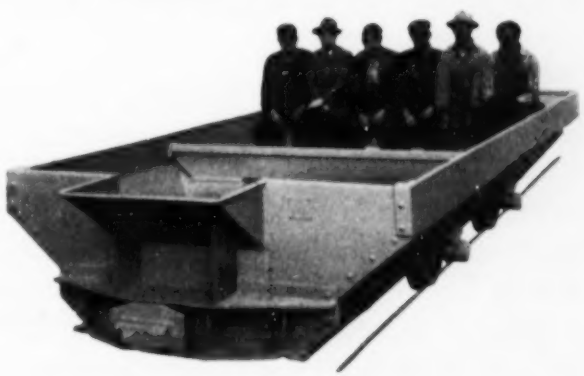


SEE IT!
BOOTH 1638
COAL SHOW

Don't fail to see one of the new S-D "Automatic" Drop Bottom Mine Cars built for low cost main line haulage for the new Uniontown, Ky. coal operation—slated to be one of the world's largest and most modern mines. This car, over eight feet wide, 19 feet long, featuring spring mounted trucks, will be on display at the Sanford-Day Booth 1638 at the Cleveland Coal Show May 11-14.

An actual cut-away car will also be displayed so you can examine in detail the features and construction of S-D "Automatics". In addition, you will want to see our full color movie showing how S-D "Automatics" are being employed to cut haulage costs in many different mining operations. Also, you will see displays of the latest developments in Man Cars and get a thorough overall picture of how Sanford-Day is being called upon by mine after mine to increase efficiency and cut costs. Remember Booth No. 1638. We'll be looking for you!

For the information of those who will be unable to attend this important Coal Show, the new S-D "Automatic", shown above and below, to be on display at the show, is 36" high, 8'3" wide, 19'7" overall in length and will haul up to 10 tons. Note that wheels are spring-mounted and that the car has overlapping spouts for continuous loading of several cars in a trip. The track gauge is 56½".



SANFORD-DAY IRON WORKS
KNOXVILLE TENNESSEE

When in Cleveland don't miss the **U. S. RUBBER** *Exhibit at Booth 1215 in the Arcade*

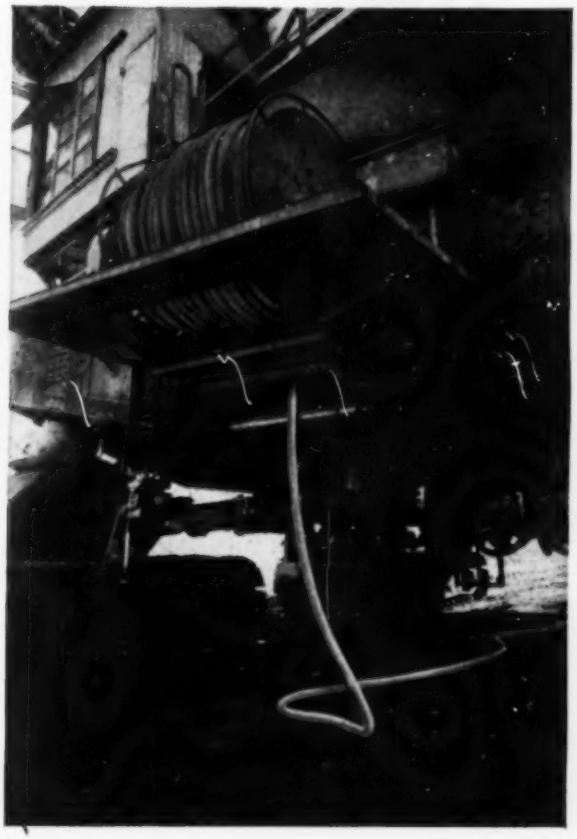
We are looking forward to the American Mining Congress Coal Show in Cleveland, Ohio, May 11-14, for it will give us opportunities to greet you in person. You can't miss our Booth No. 1215 . . . it's in the Arcade.

Here we will show you our line of U. S. Royal Portable Cords and Cables. Their performance has been proved over millions of "drag" miles, successfully carrying normal load *and* overload. The cables stand up longer —on and off reels, trailing behind locomotives, being run over by trucks, tractors and cars, being struck by picks and shovels.

And you can also inspect U. S. Mining Machine Cables at the "U. S." Booth. These rugged cables stand up under constant dragging, flexing, twisting and bruising. They have tough, abrasion-resistant jackets. They will help you keep expenses down, keep operations on schedule. We'll be expecting you at the Coal Show!

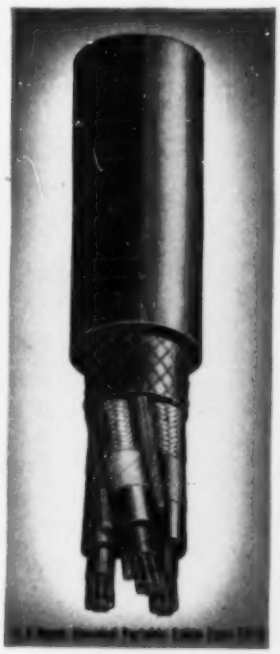
U. S. Royal Cables are

Tough!



● U. S. Royal Cords and Cables must undergo half a dozen tough tests—to make sure they can stand up under the rigorous demands of modern mining. That is why a U. S. Royal Cable is *always reliable.*

United States Rubber Company is the only wire and cable producer to grow its own natural rubber, to make its own synthetic rubber and its own plastics. "U. S." controls the quality of its product at every step of its growth and manufacture.



Trailing Cables are often subjected to severe twisting in operation. To make sure that U. S. Royal Cables can take it, they are subjected to a combined twist-bend test. In this test a 42-inch length of cable is twisted radially 90 degrees in one direction, untwisted and twisted 90 degrees in the opposite direction. While being subjected to this 180-degree twist test and while supporting a 50-lb. weight, the cable is repeatedly bent over a sheave having a diameter approximately 3 times the diameter of the cable. Most U. S. Royal Cords and Cables are required to withstand 3,000 of the above twist-bend cycles before failure.

● Write to address below for free booklet, "U. S. Electrical Wires and Cables," which describes the complete line for the mining industry.

UNITED STATES RUBBER COMPANY

U.S.RUBBER
SERVING THROUGH SCIENCE

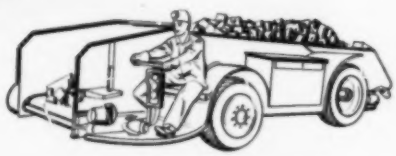
Electrical Wire and Cable Department

ROCKEFELLER CENTER • NEW YORK 20, NEW YORK

The NEW T-H Exide-Ironclad

★ 20% more capacity in the same space

★ Lowest cost per A.H. to own and operate



Heavier demands on all types of battery-powered haulage equipment dictate the need for batteries with greater capacity.

The new Exide-Ironclad T-H battery gives 20% more capacity in the same space—WITHOUT SACRIFICE OF LONG LIFE for which Exide-Ironclad Batteries are famous.

This new T-H battery is of the time-tested Exide-Ironclad construction, employing the exclusive slotted tube positive plate. New materials have made structural changes possible, which permit the use of larger positive plates—resulting in increased capacity.

The T-H line of Exide-Ironclad Batteries includes capacities for all battery-powered haulage units.

See Exide at the Coal Show
May 11-14—Cleveland
Spaces 240-41-42

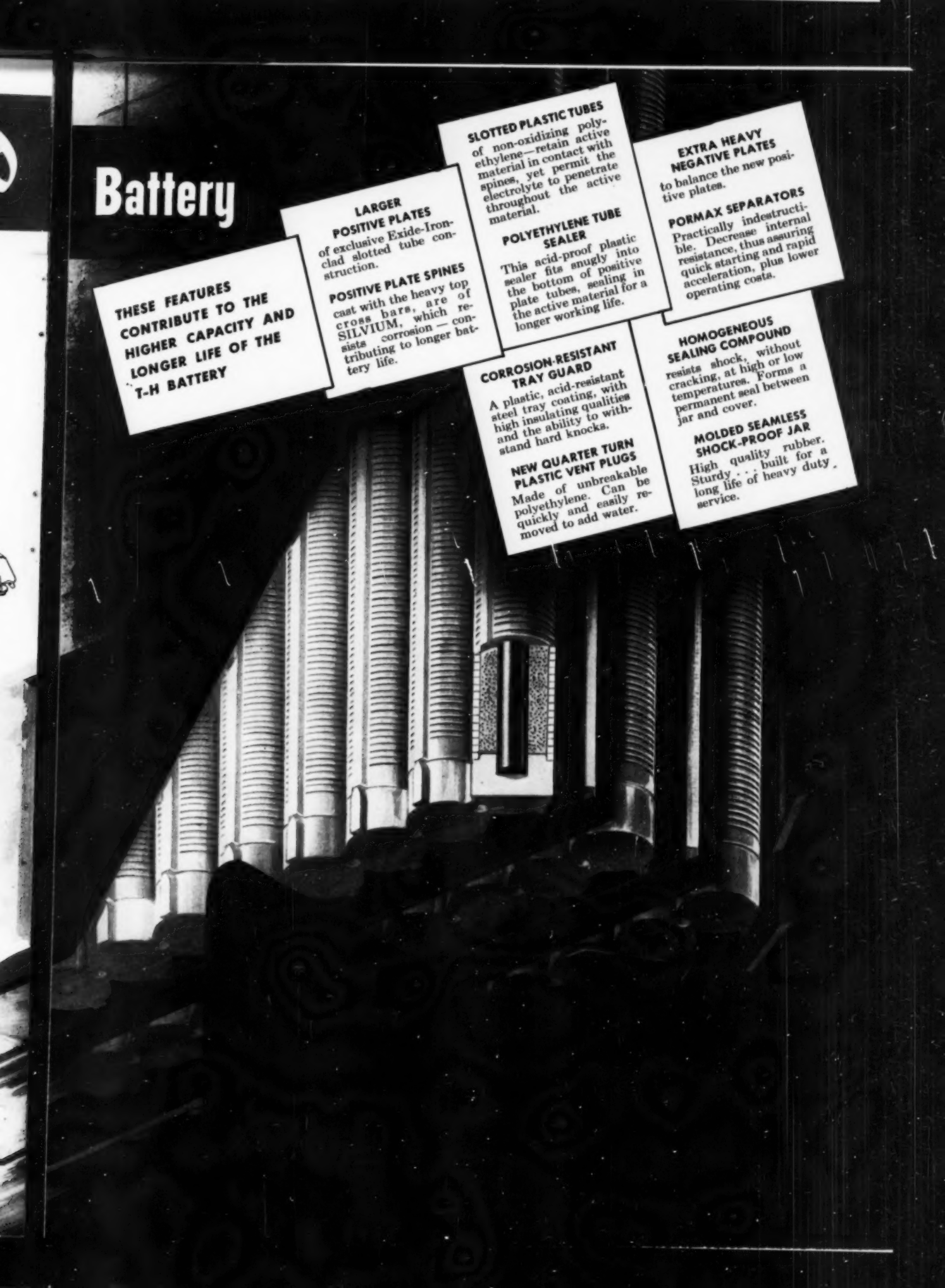
Now-more than ever before... YOUR BEST POWER BUY AT ANY PRICE!

Thrifty Hauler

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 2
Exide Batteries of Canada, Limited, Toronto

1888—DEPENDABLE BATTERIES FOR 65 YEARS—1953

"EXIDE", "EXIDE-IRONCLAD", "SILVIUM", "PORMAX", *Reg. T.M. U.S. Pat. Off.*


Battery
THESE FEATURES CONTRIBUTE TO THE HIGHER CAPACITY AND LONGER LIFE OF THE T-H BATTERY
LARGER POSITIVE PLATES
of exclusive Exide-Ironclad slotted tube construction.
POSITIVE PLATE SPINES
cast with the heavy top cross bars, are of SILVIUM, which resists corrosion — contributing to longer battery life.
SLOTTED PLASTIC TUBES
of non-oxidizing polyethylene—retain active material in contact with spines, yet permit the electrolyte to penetrate throughout the active material.
POLYETHYLENE TUBE SEALER
This acid-proof plastic sealer fits snugly into the bottom of positive plate tubes, sealing in the active material for a longer working life.
EXTRA HEAVY NEGATIVE PLATES
to balance the new positive plates.
PORMAX SEPARATORS
Practically indestructible. Decrease internal resistance, thus assuring quick starting and rapid acceleration, plus lower operating costs.
CORROSION-RESISTANT TRAY GUARD
A plastic, acid-resistant steel tray coating, with high insulating qualities and the ability to withstand hard knocks.
NEW QUARTER TURN PLASTIC VENT PLUGS
Made of unbreakable polyethylene. Can be quickly and easily removed to add water.
HOMOGENEOUS SEALING COMPOUND
resists shock, without cracking, at high or low temperatures. Forms a permanent seal between jar and cover.
MOLDED SEAMLESS SHOCK-PROOF JAR
High quality rubber. Sturdy . . . built for a long life of heavy duty service.

As you'd expect from the name, Bethlehem Hook Frog Plates actually *hook* to the frog. This is what gives them their great holding power.

Look closely at the photograph shown here. Note first that the plates are used in pairs. Each plate is equipped with an integral forged hook, and during installation one hook is placed on each side of the frog base.

Now notice the thickness and sturdiness of the hooks. They're considerably bigger and heavier than spike heads, and they can absorb terrific side thrust. Moreover, they grip the frog base so snugly that a tight fit results. It all adds up to a safe, well-aligned frog—one that doesn't jiggle, rattle, or loosen.

Plates are fastened to the ties by ordinary spiking—a quick, easy job. And here's another point that simplifies the work: since the plates are installed in pairs, the one length can be used at any tie position under the frog. This applies to virtually every frog built for mine track, regardless of size or angle.

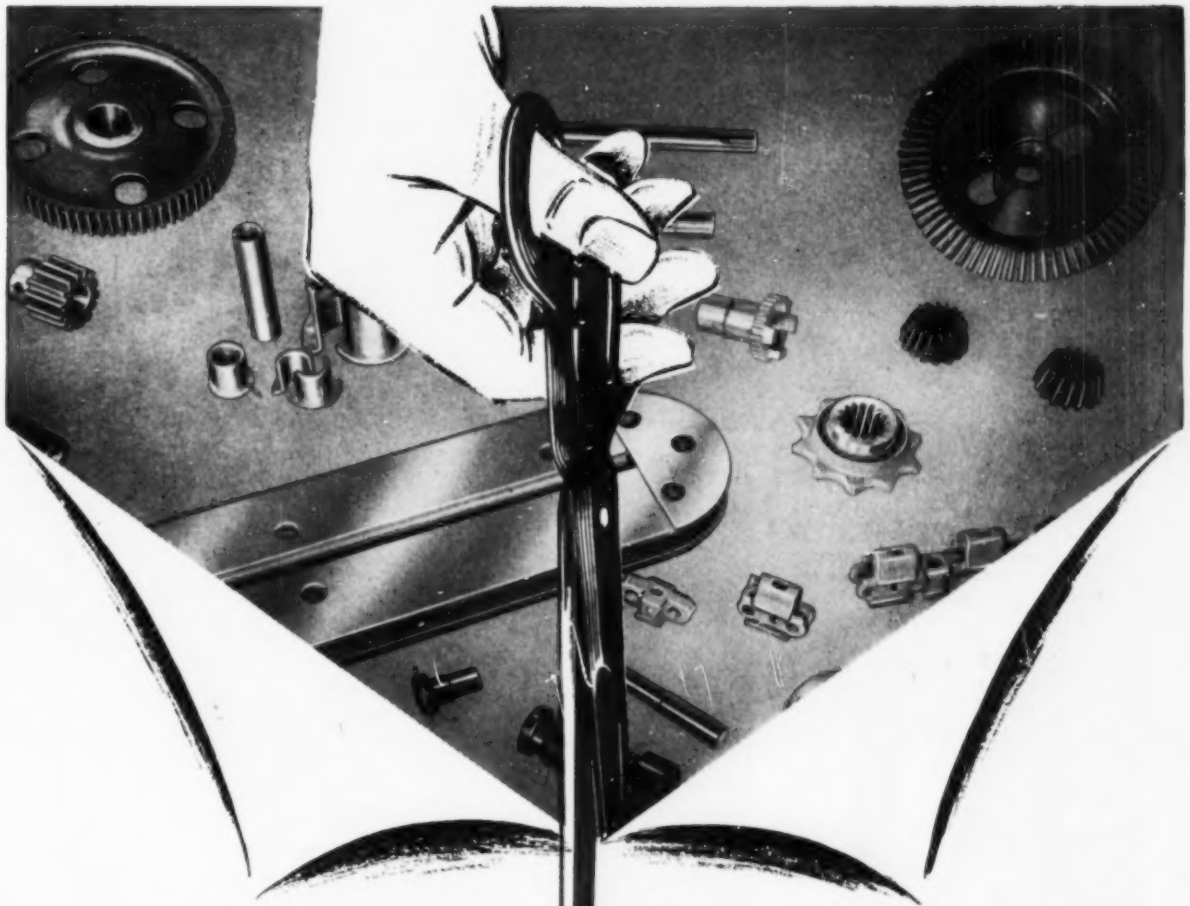
You'll be pleasantly surprised at the low cost of Bethlehem Hook Frog Plates. They're inexpensive, both to buy and to install—and there's practically no maintenance. We'll be glad to supply complete details at your request.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM HOOK FROG PLATES



CUT YOUR COSTS WITH TRACY PARTS

ALL TRACY parts are a combination of the right materials, expert workmanship and years of experience. Our cutter chains and bars are ideal for continuous low-cost cutting under all conditions because they are engineered for long wear and top performance. Similarly, all TRACY products will guarantee smoother operations with lower costs and higher output.

MANUFACTURED BY **BERTRAND P. TRACY CO.** PITTSBURGH, PENNA.

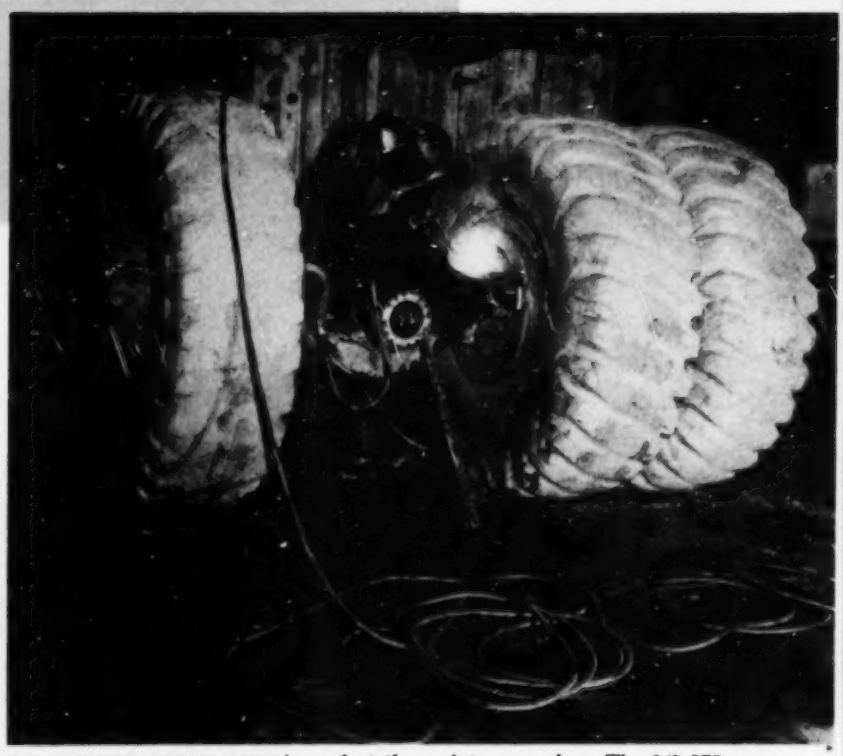
WAREHOUSES IN HARLAN, KENTUCKY • SMITHERS, WEST VIRGINIA

MILL AND MINE SUPPLY COMPANY, BIRMINGHAM, ALABAMA

the rocks

NOTICE THE FLEXIBILITY of this No. 4, 5,000 volt AMERCLAD Cable. It contains a special crepe paper slipper applied over the conductors to permit easy bending.

HERE ARE the drills that punch out thousands of feet of holes every day. Notice how easily the cable can be coiled around the take-up reels.



THIS AMERCLAD WELDING CABLE is used at the maintenance shop. The 2/0 375 amp. cable is made up of 3,325 individual wires to provide super-flexible operation and ease the strain on the operator's wrists.

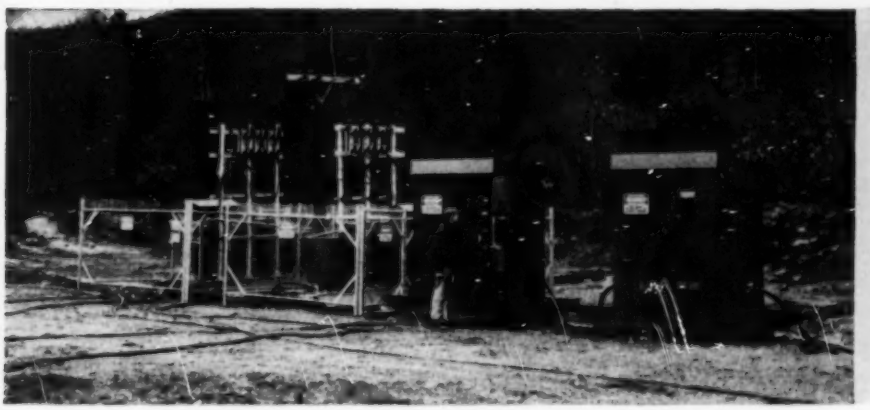
A STANDARD Cable for every

- ▶ paper & varnished cambric cables
- ▶ asbestos cords and cables
- ▶ aerial, underground & submarine cables
- ▶ shovel & dredge cables

AMERICAN STEEL & WIRE DIVISION
USS
AMERICAN ELECTRICAL WIRE AND CABLE
UNITED STATES STEEL

U·S·S AMERICAN ELECTRICAL

get so hot you can't touch them
but Amerclad
withstands the heat



THESE ARE TYPICAL switch houses and portable substation at the mine. Average length of cable used is 2,500 feet. The company has been using the original AMERCLAD for 7 years.

ONE of the nation's leading coal producers is stripping an area that is honeycombed with old mines. Many of these mines are burning, some for as long as 20 years. The rocks get so hot that you cannot walk on them or touch them, but miles of U·S·S AMERCLAD lie on the blistering rock without damage. Naturally, the mine operators try to protect the cable, but a lot of it has to lie on the ground.

This mine uses about 11 miles of AMERCLAD heavy-duty portable cable for power shovels and drills. The cable is unavoidably pulled over razor-sharp rock, soaked in acid water and exposed to the direct rays of the sun. In addition, thousands of yards of dirt and rock are blasted every day, and a lot of it comes down hard on the cable.

Despite all this, the AMERCLAD Cable is turning in a fine record of service. *It has to,* because, as the Chief Engineer puts it, "Every time a shovel is idle, there is a loss of production that is never made up."

If you have an extremely abusive use for portable cable or cord, let us show you just what AMERCLAD can do. There is a standard AMERCLAD Cable or Cord for every special application—whether it's a hand-operated drill, or a river dredge. Just send the coupon.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION
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SPECIAL Job!

- ▶ **oilproof portable cords**
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☐ Please give me more information on U·S·S AMERCLAD.
☐ Have representative call.

Name.....
Title.....
Company.....
Address.....
City.....State.....

UNITED STATES STEEL

Even knife-edged rock can't wreck G-E GEOPRENE PORTABLE CABLE

Because it stands up on the roughest jobs, G-E Geoprene portable cable is ideal for use with shovels, draglines, loaders, and other heavy portable equipment.

Its abrasion-resistant neoprene-base jacket is also resistant to most oils, acids, alkalies, sunlight, and flame. For additional strength, a tough, corded reinforcing mesh increases the cable's ability to withstand continual hauling and dragging, while the conductors themselves are rope-stranded for maximum flexibility.

In the full line of General Electric wires and cables you will find exactly the cable you need. This line includes G-E No. 1799 varnished-cambric-insulated cable, Super Coronol* cable, wire armored cable for borehole service, interlocked armor cable, aerial cable, mine telephone cable, Flamenol* control cable, and magnet wire.

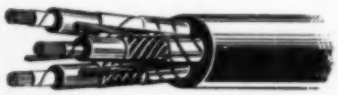
Registered Trade-mark General Electric Company

You can put your confidence in—

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

GENERAL ELECTRIC

WIRE AND CABLE IDEAS for Coal Mining



G-E mine power cable is a lightweight, high-voltage cable resistant to all the usual hazards encountered in mine operation as well as to heat, oils, acids, alkalies, sunlight, and aging. Recommended for use in haulageways, airshafts, boreholes, and for suspension from roof supports.

G-E Flamenol mine telephone cable is specifically designed for circuits where induced current and cross talk must be reduced to a minimum. Thermoplastic-jacketed cable is recommended to withstand the roughest usage; the plain twisted pair, without jacket, for less severe conditions.

G-E Flamenol station control cable has a thermoplastic jacket so resistant to moisture, oils, acids, alkalies, sunlight, and aging, that it is equally suitable for installations in ducts or conduits, in open air, or buried directly in the ground.

The wide line of G-E wires and cables for the Mining Industry is described, with valuable application data, in this 24-page illustrated booklet. For your copy write to Section W82-514, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

Eaton 2-Speed Axle Trucks cost less to run, less for upkeep,

More than
a Million-and-a-Half
in Trucks Today!

and last longer

Eaton 2-Speed Axles make available *twice* the conventional number of gear ratios, permit engines to run in their most efficient and economical range at all times, reducing stress and wear on vital parts. Eaton's exclusive planetary design, forced feed lubrication, and extra rugged construction cut maintenance cost. Ask your dealer why—working or trading—Eaton 2-Speeds make your trucks worth more.

EATON AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Superintendent, Emily Mine, Warner Collieries, reports:

Extra strength plus minimum stretch has kept this "Cordura" rayon-reinforced slope belt in trouble-free operation for some three years. It is 2250′ between centers and runs at a speed of 390′ per minute.

Tipple belt pictured here is also "Cordura" reinforced. It is a Goodyear "Coalflo" type. Over 34% slope, it carries 250 tons per hour. A 50-horsepower motor drives the belt at a speed of 245 feet per minute.

Belt reinforced with "Cordura" rayon cost no shutdown time in 3 years

In three years of operation at the Emily Mine of Warner Collieries, Mammoth, W. Va., this 30″ slope belt has virtually eliminated lost time due to shutdowns, according to Paul Smith, mine superintendent. It was manufactured by Goodyear Tire and Rubber Company on a 6-ply carcass of Du Pont Cordura* High Tenacity Rayon.

Rough slate as well as coal is hauled by the belts in this mine, and the crossbelt drops are unusually high. Warner's engineers choose belting reinforced with "Cordura" yarn because of its great strength, which provides resistance to heavy shocks, and because of its minimum stretch and easy troughing.

Here's why "Cordura"-reinforced belts offer these proven advantages. Man-made "Cordura" yarn is inherently stronger than natural fiber yarn. This permits manufacturers to make a belt thinner . . . with fewer plies . . . yet stronger. These thin belts are naturally more flexible, trough better, have less tendency to crack and separate.

Find out about conveyor belts made with "Cordura" yarn. We'll be glad to send you the names of suppliers . . . also give you full information about "Cordura" in the booklet "Sinews for Industry." Write for your FREE copy to: Textile Fibers Dept., Room 2504 H-5, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

*REG. U. S. PAT. OFF.

Du Pont "Cordura" High Tenacity Rayon

STRENGTH AT LOW COST

DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Homocord Conveyor Belt—More use per dollar

Homocord Conveyo re use per dollar

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Homo r dollar

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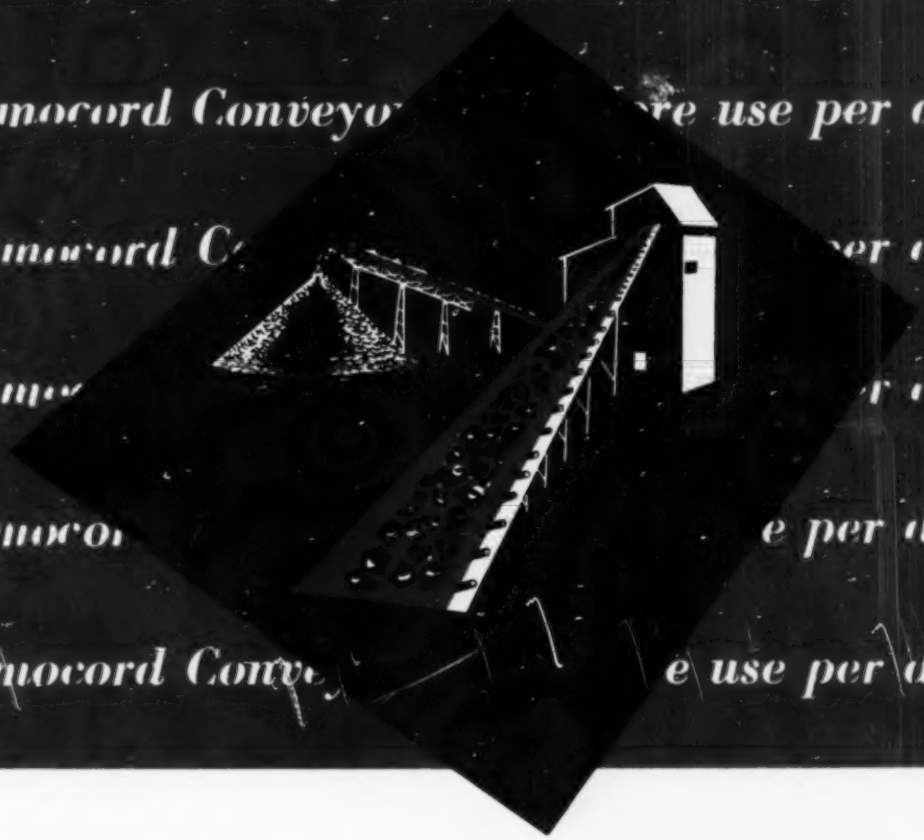
Homocord Conve e use per dollar

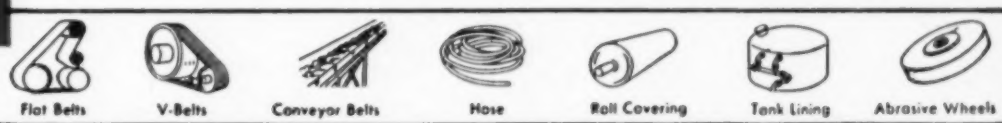


MORE SHOCK-LOAD CUSHIONING . . . The extra body-cushion built into Homocord Conveyor Belt dissipates even the shock of sharp impact from large lumps of coal, rock and ore . . . A Homocord Conveyor Belt resists gouging and cutting. It lasts longer . . . and hauls more too—because it troughs naturally and trains easily in the idlers. That's MORE USE PER DOLLAR. Another R/M Conveyor Belt, Ray-Man "F", is designed particularly for underground mining where pulleys are small and great flexibility and tear resistance are needed. Both of these R/M belts give you long life on the job, MORE USE PER DOLLAR. Ask the R/M distributor for Bulletins 6906 and 6915. R/M field engineers back him up to save you money—not only in conveyor belts, but in hose, transmission and V-belts.

RM

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Teflon Products • Packings • Sintered Metal Parts • Bowling Balls

These coal-burning utilities plan to grow . . .

Will They Be Your Customers?

	Coal Used in 1950 (Tons)	Planned New Capacity, 1951-54 (Kw)
NEW ENGLAND		
Connecticut Light & Power Co.	602,000	60,000
Hartford Electric Light Co.	142,000	66,000
Boston Edison Co.	215,000	81,000
United Illuminating Co.	205,000	30,000
Western Massachusetts Elec. Co.	190,000	46,000
Rockland Light & Power Co.	72,000	88,000
MIDDLE ATLANTIC		
American Gas & Electric Service Corp.	6,851,000	850,000
Consolidated Edison Co.	4,328,000	790,000
West Penn Electric Co.	3,862,000	557,000
Duquesne Light Co.	2,997,000	185,000
Niagara Mohawk Power Co.	2,816,000	520,000
Philadelphia Electric Co.	2,544,000	600,000
Pennsylvania Power & Light Co.	2,176,000	600,000
Pennsylvania Electric Co.	1,489,000	318,000
Public Service Electric & Gas Co.	1,046,000	415,000
New York State Electric & Gas Corp.		
Scranton Electric Co.		
Long Island		
	3,964,000	450,000
	3,078,000	500,000
Cleveland Elec. Illuminating Co.	2,311,000	482,000
Consumers Power Co.	2,137,000	120,000
Public Service Co. of Indiana	1,835,000	411,000
Wisconsin Electric Power Co.	1,634,000	240,000
Cincinnati Gas & Electric Co.	1,387,000	240,000
Indianapolis Power & Light Co.	936,000	200,000
Columbus & Southern Ohio Electric Co.	832,000	100,000
Central Illinois Public Service Co.	828,000	120,000
Toledo Edison Co.	773,000	120,000
Dayton Power & Light Co.	714,000	60,000
		150,000
Wisconsin Public Service Corp.	284,000	60,000
Wisconsin Power & Light Co.	369,000	60,000
Southern Indiana Gas & Elec. Co.	332,000	20,000
Northern Indiana Public Service Co.	268,000	70,000
Lansing Board of Water & Electric Light	196,000	96,000
Central Illinois Elec. & Gas Co.	158,000	30,000
Lake Superior District Power Co.	88,000	20,000
WEST NORTH CENTRAL		
Union Electric Co. of Missouri	1,847,000	110,000
Northern States Power Co.	1,230,000	225,000
Kansas City Power & Light Co.	681,000	332,000
Iowa Electric Light & Power Co.	475,000	70,000
Iowa-Illinois Gas & Electric Co.	473,000	60,000
Black Hills Power & Light Co.	116,000	
Iowa Public Service Co.		
Interstate		
		90,000
	1,206,000	25,000
Consolidated Gas, Electric Light & Power Co.	1,136,000	150,000
Georgia Power Co.	830,000	180,000
Carolina Power & Light Co.	516,000	52,000
Pennsylvania Water & Power Co.	198,000	66,000
Eastern Shore Public Service Co.	196,000	240,000
EAST SOUTH CENTRAL		
Alabama Power Co.	929,000	240,000
Louisville Gas & Electric Co.	767,000	60,000
Kentucky Utilities Co., Inc.	652,000	150,000
Tennessee Valley Authority	498,000	2,700,000
MOUNTAIN		
Public Service Co. of Colorado	207,000	68,000
Utah Power & Light Co.	93,000	120,000
Total	80,291,000	15,380,000

These Utilities, Like Many Others, Boosted Their Coal Use, 1951-52

	Coal Burned (Tons) 1951 (Actual)	1952 (Projected)
Hartford Electric Light Co.	301,000	375,000
Philadelphia Electric Co.	3,090,000	3,513,000
New York State Electric & Gas Corp.	1,017,000	1,182,000
Long Island Lighting Co.	387,000	518,000
Rochester Gas & Electric Corp.	569,000	621,000
Detroit Edison Co.	4,440,000	4,600,000
Ohio Edison Co.	3,581,000	3,960,000
Consumers Power Co.	2,281,000	2,450,000
Central Illinois Public Service Co.	867,000	890,000
Lansing Board of Water & Electric Light	314,000	325,000
Black Hills Power & Light Co.	131,000	150,000
Total	16,978,000	18,584,000

Source: *Keystone Coal Buyers Manual*, a *Coal Age* affiliate. Additional data may be obtained upon request to Keystone Coal Buyers Manual, 330 W. 42 St., New York 36, N. Y.

November, 1952 • COAL AGE

NEW MINES AND OLD-FIND ALLEN

A & G

A & G Engineering

VALUABLE IN INTERPRETING INCREASED OPERATING PLANS INTO EFFICIENT RESULTS

Your progressive coal production plans and requirements receive specialized engineering. In no case does a previous project become a model for the design and construction of any new assignment—except in the time-tested A&G fundamental engineering.

The services of A&G begin first with thorough consultation with your organization on every detail involving your present or planned operation. Next there is careful and complete study by our experts on all phases of your problems. Our report to you, which follows this study, provides amply for the present and fully anticipates the future.

In no case do we ever sell a "packaged unit."

We are an engineering organization exclusively, with no machinery to sell. We do make equipment recommendations because of our experience and purchases are made from various sources accordingly.

A choice of one of two fee plans is available — both being in your favor. One is a flat fee determined at the time of our estimate. The other is one where we go along with you on a small percentage basis figured on the final cost of the project. If the costs are lower or higher than the original estimate, our percentage fee naturally varies accordingly.

We will contact you at any time that you are ready.

★

SCOPE OF SERVICES

- Design and construction of new plants and their various units.
- Organization, operation and management of mines.
- Below ground modernization and mechanization.
- Reconstruction, revamping, or improvement of existing plants.
- General consulting work regarding power, equipment, operation, and various mining problems.
- Valuations for financing, fire loss, taxation purpose—reports and appraisals.

We work with undivided responsibility to you on a cost and fixed fee basis.

We are not hampered by any connections which might prejudice the true professional engineering approach to your problem.

ALLEN & GARCIA COMPANY

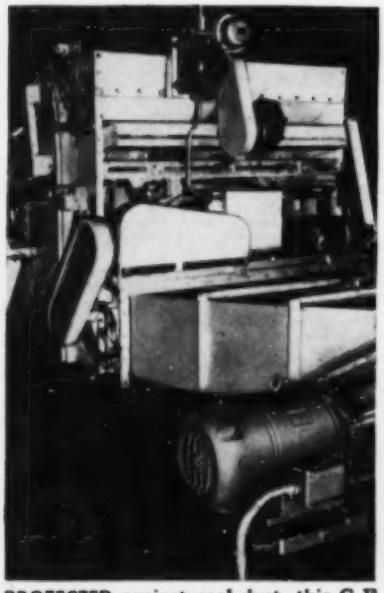
Consulting and Construction Engineers

332 S. MICHIGAN AVE., CHICAGO 4, ILL. • 120 WALL ST., NEW YORK 5, N. Y.

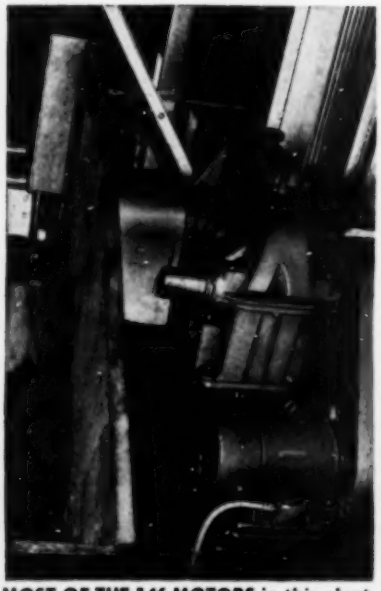
ENGINEERING REPORTS:

CENTRALIZED CONTROL of plant motors at Crown Mine's new preparation plant co-ordinates processing, saves steps, uses manpower most efficiently. This control desk, one of three in the plant, controls the operation of the loading booms.

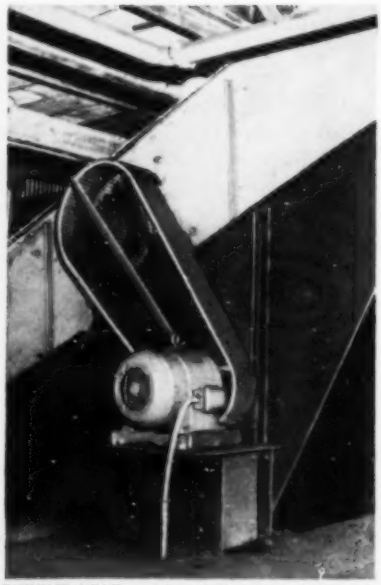
New coal plant cuts downtime



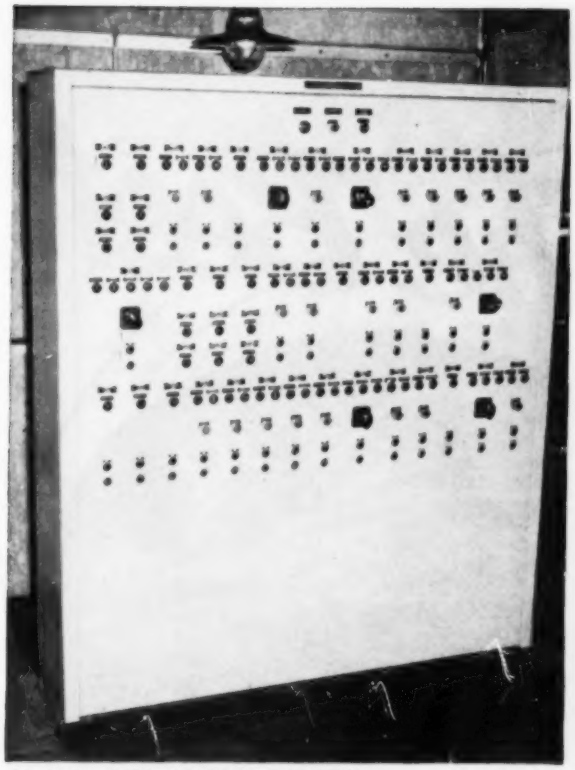
PROTECTED against coal dust, this G-E totally enclosed fan-cooled motor drives an air-flow cleaner in the prep plant.



MOST OF THE 146 MOTORS in this plant, like this one driving a crusher, are G-E totally enclosed fan-cooled motors.



DEPENDABLE service with only minimum maintenance is typical of G-E motors, like this one driving an ROM apron feeder.



CO-ORDINATED CONTROL SWITCHES are combined with indicating lights in this panel benchboard on the jig floor.

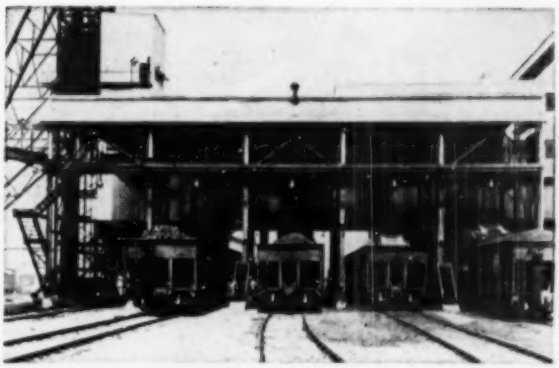
SEQUENCE OPERATION of plant motors is obtained through interlocks and timers in this G-E Cabinetrol assembly.

with co-ordinated G-E drives

Crown Mine uses G-E motors and control system-engineered to meet plant's needs

Freeman Coal Corporation's new Crown Mine preparation plant at Farmersville, Illinois, is a fine example of the way General Electric co-ordinates motors and control into a smooth-working system to maintain consistently high output at low cost. From self-dumping skips for ROM coal to automatic loading booms for clean coal, G-E system-engineered drives keep processing in step, minimize downtime, make most efficient use of manpower.

You, too, can profit by putting G-E engineering leadership to work on your preparation-plant problems. For more information, contact your local G-E Apparatus Sales Office, or write for Bulletin GEA-5308, "Electrified Coal Preparation," to General Electric Co., Section 663-31, Schenectady 5, N. Y.



LOADING BOOMS discharging into railroad cars are controlled from boom operator's cab (upper left). Sequence control utilizing G-E Cabinetrol co-ordinates conveyor operation.

Engineered Electrical Systems for Coal Preparation Plants

GENERAL ELECTRIC

Booths 2205-2207 at the Coal Show

Equipment for Dewatering Coal Fines

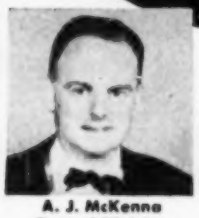
The Best

OLIVER HORIZONTAL FILTER
Ideal for handling sizes ranging from ⅜ to about 200 mesh

AMERICAN DISC FILTER
Ideal for handling sizes ranging from 20 mesh to 0

Those in attendance at our Booth at the COAL SHOW will include:

G. G. Reed
Central Division



A. J. McKenna
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ONE-TWO PUNCH in the Business

In dewatering fine coal, as in many other processing steps, the best job from the standpoint of both efficiency and economy is often done when operations are broken up into successive steps. Extensive tests on fines show that when the Horizontal Filter takes care of the coarser sizes and the American handles the finer meshes, excellent results are obtained. Hydraulic Classification can serve to make the separation for feed purposes.

- **Both filters have exceptionally high dewatering capacity. Building space per tonnage handled is relatively small.**
- **Both filters handle coal very gently. Degradation is negligible.**
- **Both filters form relatively dry, readily dischargeable cake. It can be easily handled and disposed of.**
- **Both filters deliver disposable or reusable filtrate. Carries less than 1% solids.**
- **Both filters are slow speed units. Maintenance is negligible.**

When you come to the Coal Show in May, visit our Booth—Nos. 2205 and 2207—where you can study scale models of these two filters, complete in every detail . . . where you can discuss your problems with our coal filtration specialists who will be in attendance. If you find you cannot attend, send for descriptive literature of both of these filters and let us know when you would like to have a representative call.

NEW YORK 36 – 33 West 42nd Street • CHICAGO 1 – 221 North LaSalle Street
OAKLAND 1 – 2900 Glascock Street • SAN FRANCISCO 11 – 260 California Street
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Bring out the best

IN YOUR MINE

Wherever you find outstanding safety and economy records you'll find Chicago Pneumatic equipment. That's why CP's Mobile Permissible Roof Bolting Units . . . Single and Double-arm Permissible Tramdrills . . . Roof Bolt Stopers and Impact Wrenches . . . Hand-held and post-mounted Permissible Coal Drills . . . and many other pneumatic and electric tools for faster, safer, more efficient mine operation and maintenance are specified by operators everywhere.

Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17. N. Y

CP Permissible Tramdrill — can be driven in seams as low as thirty inches — handles easily in narrow working areas. Drills shot holes in coal up to 4½" in diameter within four inches of roof or bottom—and at any angle! CP Tramdrills are all-electric — drill arm controls are within easy reach of operator. Available for single or double arm operation.

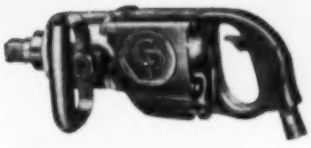
RBD Permissible Mobile Roof Bolting Unit — all electric and easy to operate under any condition. Completes entire bolting cycle in 3 minutes flat — auger and bolt setter are driven by same motor. Telescopic chuck has 10 inch auger adjustment to conform to roof irregularities. Unit is equally efficient in high coal as well as low seams.

Write CP for complete information!

★ *Visit* OUR BOOTH 1513 AT THE 1953 COAL SHOW MAY 11 TO 14.

CP-574 Permissible Post-Mounted Coal Drill has drilling speeds up to 40 inches a minute — can drill 40 to 60 holes per shift.

CP-572 Permissible Hand-Held Coal Drill — weighs only 43 pounds — is a real work horse — has safety clutch for automatic release if auger sticks, protecting both operator and motor.



CP-3630 Air Impact Wrench, capacity to ¾" bolt size.

CP-365 Air Impact Wrench, capacity to 1¼" bolt size.

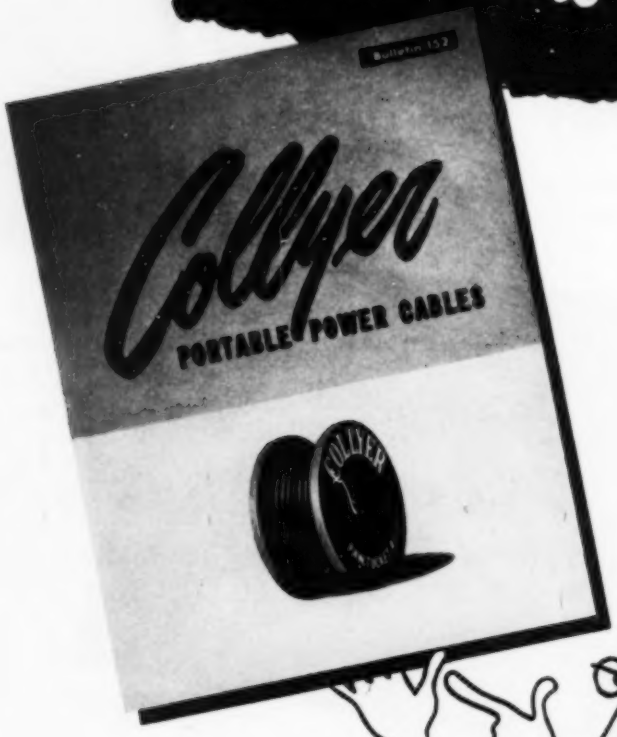
CP-134 Roof Bolt Stoper.

For Speedy Roof Bolting In The Harder Veins — a CP Short Stoper and CP Air Impact Wrench form a perfect team for drilling bolt holes and running and reclaiming roof bolts. The CP-134 Short Stoper is available in four models designed to handle steel changes of 12", 18", 24" and 36". The "in line" feed thrust of the twin feed cylinders reduces binding, lengthens bit life, increases drilling speed. A rotation release permits driving wedge-type bolts. Available in wet or dry types.

Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Need Cable ?



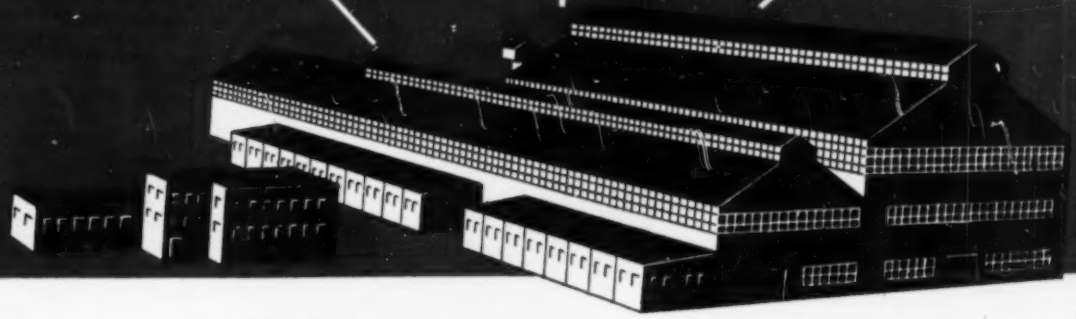
Check with Collyer

Write for your copy of this new, comprehensive Bulletin 152 describing the complete line of Collyer Portable Power Cables. Collyer Insulated Wire Company, 245 Roosevelt Avenue, Pawtucket, Rhode Island.

LOADERS

SHUTTLE CARS

CUTTERS



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has complete facilities for rebuilding
JOY Equipment

HERE'S WHAT THIS PLANT OFFERS YOU!

Definitely Scheduled Delivery
Down time of your equipment is greatly reduced—you know when job will be delivered.

Cost Savings Through Advanced Methods
Efficient plant, methods and tools mean lower rebuilding costs to you.

You Need Not Carry Expensive Replacement Parts
Ashland carries an extensive inventory of replacement parts for all Joy equipment—eliminating costly inventory expense for you.

Genuine Joy Parts Used
Your Joy equipment is quickly renewed to initial factory standards with genuine Joy parts.

Changes to Your Specifications
At Ashland, refinements or special features may be added to Joy equipment to give the advantages of a later model, or to better suit your requirements.

Relieves Capital Expense on Your Part
No need now to do your own rebuilding. Ashland Division facilities and the use of genuine Joy parts makes possible savings in your plant, overhead and personnel. Also, down time is cut to a minimum, and a rebuilding job equal to factory standard is assured.

At the Cleveland Coal Show—be sure to visit our exhibits in Booths 2409-11-13-15 in Lower Lakeside Hall.

National Mine Service Company

Has the Facilities—Delivers the Goods

7 Plants to Serve You

ALL-STATE DIVISION Logan, W. Va.
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Keep Your Mechanical Equipment With Rome 60

* Open braid firmly interlocks conductor to tough, all-resistant Neoprene sheath . . . prevents loosening and sheath separation from twisting, bending and pulling.

* Grounding conductor is solidly embedded in Neoprene. This integrated construction provides exceptional protection against "shorts" and mechanical injury . . . maintains flexibility and reduces conductor distortion and fatigue.

Rome 60 Line Includes: Type SO Portable Cords • Single Conductor Locomotive Cables • Concentric Mining Machine Cables • Twin (Parallel Duplex) Mining Machine Cables—Types W and G • Multiple Conductor Portable Power Cables—Types W and G • Shot Firing Cord • Mine Power Distribution Cable • Shovel and Dredge Cables

on-the-Move

Mining Cables

Did you ever stop to figure the cost of mining cable failure? . . . the cost in tonnage losses, in man hours wasted, in expensive equipment standing idle? *It's always many times the cost of the cable itself.* That's why we say "It Costs Less To Buy the Best" . . . Rome 60 Mining Cables.

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COAL SHOW

MAY 11-14

And, while there, see our display of better Rome 60 mining cables. Rome Cable personnel will be happy to discuss your cable problems or just sit and visit.

In any event, stop and say hello. We will be looking for you.

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IN THE ARCADE

INTERLOCKED CONSTRUCTION—Take a good look at the Parallel Duplex Shuttle Car Cable, illustrated at the left. Note how the open braid around each conductor firmly interlocks . . . actually "gears" it to the Neoprene sheath. This prevents failure from twisting, pulling, and sheath separation. As an extra feature, the heat-resistant rubber insulation offers exceptional overload protection—is suitable for operation at 75° C.

MAXIMUM FLEXIBILITY—Now, see how the grounding conductor is separated from the insulated conductors by a tough, highly resilient Neoprene webbing. Result? . . . Maximum flexibility, high resistance to impact, less conductor fatigue, as well as increased protection against "shorts." There are no fibrous "separators" to rot, deteriorate or wick moisture.

ALL-RESISTANT NEOPRENE SHEATH—And now a glance at the Neoprene sheath . . . Molded in lead to a tire-like toughness, it is highly resistant to acids, oils, abrasion and flame. P-105 BM molded in the Neoprene sheath is your assurance of compliance with Federal and Pennsylvania Safety Codes. Depend on Rome 60 Mining Cables to keep the power flowing in—and the coal flowing out.

It Costs Less to Buy the Best

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OPPORTUNITY FOR EXTRA INCOME

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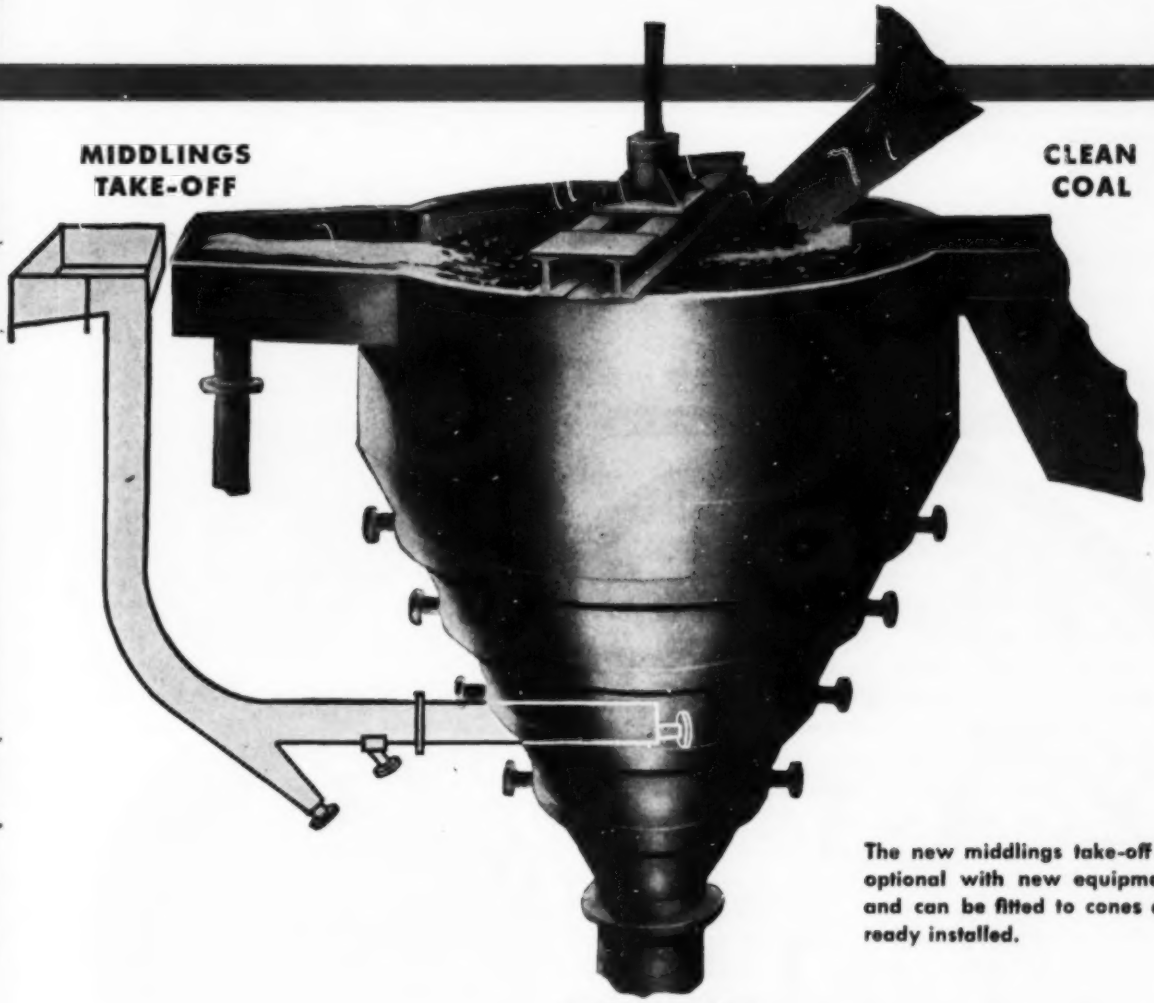
3. Removes Refuse . . . clean of coal . . . no loss on your refuse pile.

Find out more about this new 3-Product Chance Cone. Write for full details today.

THE HEART OF THE PREPARATION PROCESS

MIDDLINGS...



The new middlings take-off is optional with new equipment and can be fitted to cones already installed.

UNITED ENGINEERS & CONSTRUCTORS INC

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"Place the cap and fuse alongside the end of the Primacord trunk line and bind together lightly but firmly with friction tape. Don't tie them together with string or wire – don't lay them under a rock! Place the cap gently on the ground and lay out your length of safety fuse*.

"Remember – in blasting, safety is a sign of skill. Be careful, all-ways."

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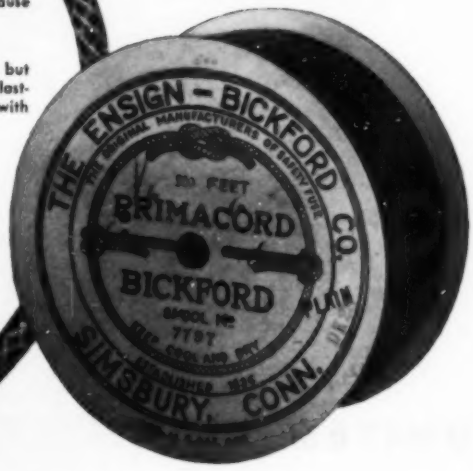
Simsbury, Connecticut
Also Safety Fuse since 1836

*Primacord can also be detonated with an electric blasting cap.

1. Cut the Safety Fuse squarely across with a clean, sharp knife to expose the powder core. Be sure you cut the fuse long enough, because a little more fuse is a lot more safety.

2. Seat this freshly cut end lightly but firmly against the charge in the blasting cap, and crimp cap onto fuse with a crimping tool.

3. Lay the Safety Fuse and its cap alongside the end of the Primacord trunk line, and bind lightly but firmly together, using friction tape. Place the cap gently on the ground and lay out your length of Safety Fuse.



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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

MAY, 1953

IVAN A. GIVEN, EDITOR

Better Than Even

THE MEN ON THE FIRING LINE in the battle against increased residual-oil imports have maintained from the start that the campaign against dumping in coal markets has a better-than-even chance of succeeding. A piece of supporting evidence recently come to light is the reaction in oil and oil-publication circles. That reaction has generated a noticeable increase in material either trying to play down the situation or explain away the evidence as to the increase in the residual flood and what it means not only to coal but to the economy of the Nation. It therefore can be taken that import circles feel that there is something to the campaign and to its chances of success.

No flow of words, however great, can alter the basic facts set forth, among other places, in "Foreign Oil . . . How It Hurts America . . . How It Can be Curbed," presented in the March issue as a part of *Coal Age's* service on industry problems of all types, which service has included the production of thousands of reprints of the residual-oil study for distribution to Congress and for the use of coal men and their supporters in the residual-oil fight. That study showed that residual oil is coming in in increasing volumes, that it is being dumped to the disadvantage of coal and allied industries and their employees, that that dumping is being made possible by increasing the prices of other petroleum products, and that independent oil producers, along with others, believe that the rising tide of imports adversely affects the domestic petroleum industry and endangers national security.

The battle soon will be further joined before Congressional committees and from there quite likely will move to the floors of both houses. Oil importing organizations undoubtedly will put up a determined fight and will be joined by other groups interested in much-freer or unrestricted imports into the United States. On the other hand, coal will be joined by other industrial groups being hurt by heavy imports of other products as a result of special conditions which make it difficult for United States industries to compete in home markets. The fight wll be no easy one, but coal certainly has the facts in its favor. By presenting them vigorously and pressing its story home not only to committees but to individual senators and representatives, it has, as noted, better than an even chance of success. That is a job not only for industry organizations but for each man with his own senators and representatives.

Billion for One

"HAVE MACHINES and machine methods paid off in coal mining? Is there room for additional savings of equal or greater magnitude in the future? If so, in what directions do they lie?"

The preceding sentences lead off the study of the effects of the machine on coal mining beginning on the following page of this issue. That study shows that coal has spent over a billion dollars for underground and surface production equipment in the past 10 years, excluding preparation plants and service facilities equivalent to another billion. As a result, the bituminous mine price is, on the average, at least a dollar a ton less than it otherwise would have been. That is a handsome gain, in large part a direct result of the use of machines, machine methods and modern materials for supporting activities.

Cost cutting still remains the order of the day, and the future opportunities are every bit as good as those of the past. As for the machine and materials side, the 1953 Coal Show in Cleveland will provide a new bench mark. At the same time, the technical sessions will highlight the important problem of getting maximum machine output. Planning for the future therefore should include thorough study of the equipment and operating information to be made available at the show. The benefits in cost, quality and safety are well worth a major effort to attend and participate.

1. THE CONTINUOUS MINER

2. THE LONGHOLE DRILL

Efficiency—Machine Made

What machines have done for coal to date
How machines can be made to do more for coal
What the future holds in machine production

HAVE MACHINES and machine methods paid off in coal mining? Is there room for additional savings of equal or greater magnitude in the future? If so, in what direction do they lie?

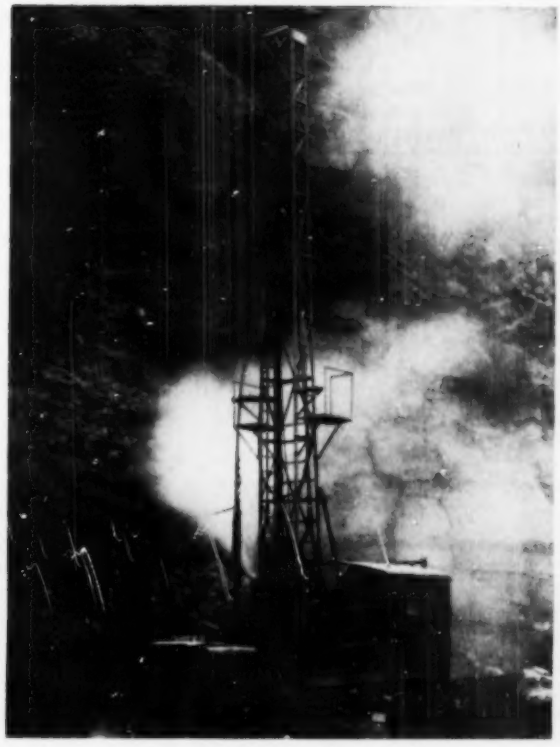
In the 10 yr since 1942, the anthracite and bituminous industries have invested approximately $2,000,000,000—and perhaps more—in new mines and new equipment, including preparation plants and such auxiliaries as ventilating and power equipment and so on. At least half, or more than $1 billion, has gone for mechanical-mining and stripping equipment proper, including such auxiliaries as cutting, drilling and transportation equipment.

One benefit is rather easily arrived at. In 1942, for example, tons per man per shift in the bituminous industry was 5.12. In 1951, the last year for which Bureau of Mines figures are presently available, tons per man had risen to 7.04. The present base wage is $18.25. Dividing by 7.04 results in a wage cost of $2.59. If tons per man had stayed at the 1942 level of 5.12, the wage cost would divide out to $3.56 per ton. Admittedly, the exact wage-cost figures cannot be arrived at this way, but the difference in cost per ton can be determined with reasonable accuracy.

In other words, the bituminous investment, with other improvements in methods, has resulted in a saving of around $1 per ton in a period of 10 yr. Putting it another way, average mine price would have had to be at least $1 per ton higher today than if the efficiency increase had not taken place. Of course, depreciation and obsolescence cost per ton has risen with the increase in equipment investment, but there is evidence that economies in the use of supplies and power, in ventilation and drainage, and in other directions have been sufficient to offset this in large part if not completely, leaving the saving in labor as a real net.

All the coal-producing states have racked up gains in tons per man since 1942, as the accompanying table, based on Bureau of Mines data, shows. The increase between 1942 and 1951 ranges from 5.4 to 156.5%. The smallest gains, incidentally, were made in the states where there already was a high degree of mechanical mining, as in Utah; also Indiana, where stripping already had reached a point where it

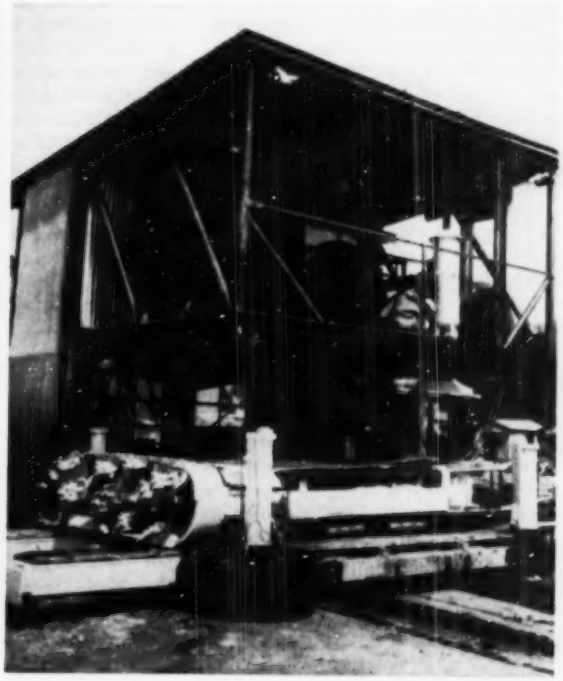
3. THE BIG WALKING DRAGLINE



4. THE HIGH-CAPACITY DRILL

BILLION FOR ONE—Six items in coal's $1,000,000,000 investment in production equipment in the past 10 years, which has cut labor cost $1 per ton.

5. ROOF-BOLTING



6. THE REMOTE MINER

A Decade of Machine-Mining Progress—1942-51

	Number in Use								Per Cent Mechanically Loaded		Per Cent Stripped		Tons per Man		% Rise, TPM
	Loading Machines		Self-Loading Conveyors		Hand-Loaded Conveyors		Strip Shovels, Draglines								
	1942	1951	1942	1951	1942	1951	1942	1951	1942	1951	1942	1951	1942	1951	
Ala.	59	144	22	13	350	222	15	100	45.6	73.7	1.6	10.77	2.82	5.00	77.3
Ark.	.....	.....	.....	2	67	83	8	14	63.8	53.6	9.2	10.73	2.99	4.41	47.5
Colo.	25	40	149	184	103	95	.....	8	47.5	62.1	0.1	18.47	4.31	5.49	27.4
Ill.	559	475	16	16	10	4	128	172	63.6	62.9	24.3	33.8	8.62	11.04	28.1
Ind.	142	158	.....	.....	.....	4	171	138	65.9	41.3	57.0	56.5	10.70	11.28	5.4
Iowa	2	2	14	4	11	.....	57	84	10.4	2.7	23.9	70.6	3.59	6.79	89.1
Kan.	.....	.....	.....	.....	.....	.....	60	47	.....	.....	85.5	96.2	7.18	11.73	63.4
E. Ky.	111	500	71	146	154	459	4	111	18.6	47.8	0.3	5.0	4.10	5.61	36.9
W. Ky.	67		116		11		18	118	58.2		9.7	41.6	6.51	14.24	118.8
Md.	.....	4	.....	3	27	15	4	24	.....	13.1	1.2	28.2	3.41	4.53	32.8
Mo.	.....	.....	.....	.....	.....	.....	70	48	.....	.....	66.5	92.2	4.65	11.92	156.5
Mont.	44	30	2	14	.....	.....	5	8	48.8	33.8	32.1	63.7	11.57	16.61	40.1
N. M.	9	16	.....	1	.....	.....	.....	.....	.....	79.2	.....	.....	3.18	5.30	66.7
N. D.	5	3	.....	.....	.....	.....	49	49	.....	7.0	67.6	92.2	10.46	20.06	91.7
Ohio	151	229	135	60	57	35	273	681	47.2	36.7	28.5	56.9	5.95	10.35	74.0
Okla.	.....	5	.....	.....	.....	131	23	43	24.3	37.2	46.1	55.0	4.68	5.92	26.5
Pa. Bit.	477	1,015	66	61	803	834	440	1,476	29.2	53.9	8.0	21.6	4.71	6.01	27.6
S. D.	.....	.....	.....	.....	.....	.....	6	3	.....	.....	91.9	100.0	5.29	9.12	65.7
Tenn.	4	36	15	38	96	72	.....	49	22.5	36.5	.....	8.9	3.45	4.90	42.0
Utah	44	127	30	70	45	15	.....	.....	85.3	97.9	.....	.....	6.91	7.41	7.2
Va.	45	131	15	52	92	156	.....	59	22.1	44.8	.....	6.4	4.23	5.78	36.7
Wash.	1	1	11	9	85	84	.....	8	52.5	68.2	2.0	8.6	3.31	4.25	28.4
W. Va.	533	1,462	167	362	1,003	1,668	92	540	45.0	70.9	1.7	8.0	5.19	6.66	20.6
Wyo.	23	32	233	205	54	27	5	23	94.4	70.7	2.3	28.6	6.85	9.72	41.9
U. S. Bit.	2,301	4,410	1,062	1,242	3,041	3,904	1,438	3,810	40.0	57.1	11.5	22.0	5.12	7.04	35.6
Pa. Anth.	524*	528*	.....	.....	2,491†	3,282†	348‡	595	24.4	25.4	15.0	26.0	2.95	2.97	.....

*All scrapers in 1942; includes 43 loading machines in 1951. †Includes self-loading conveyors and pit-car loaders. ‡Total is for 1940; data not available for 1941 or 42.

was accounting for 57% of the state total.

Examination of the table shows major gains in practically all states in (1) loading machines in use underground, and (2) in stripping shovels aboveground. The exceptions as far as number of stripping shovels and draglines in use are in Missouri, Kansas and Indiana. In Missouri, the number dropped from 70 in 1942 to 48, while tons per man rose 156.5% from 4.65 to 11.92. The record in Kansas was substantially similar. In both instances, the decline in equipment use reflects replacement of small equipment with large and concentration of operations in bigger pits. The decrease in Indiana is largely a result of wider use of big walking draglines, enabling strip producers to maintain their percentage in spite of the smaller number of units in service.

Only two of the major coal-producing states failed to report the use of strip shovels in 1951. They were New Mexico and Utah. In 1942, the number was six—Colorado, New Mexico, Tennessee, Utah, Virginia and Washington.

Illinois, Montana and North Dakota were the only major states to show declines in number of loading machines in use in 1951 compared to 1942, reflecting both the growing importance of stripping in those states and, in the case of Illinois in particular, replacement of older loaders with modern high-capacity units, as well as the opening of new deep mines employing late-type loading equipment and auxiliaries.

Hand-loaded and self-loading conveyors showed only modest gains in the bituminous industry between 1942 and 1951, reflecting increased emphasis on loading by mobile machines.

10-Year Leader

Considering all phases of both deep and strip mining, the outstanding record for progress in the past 10 yr has been set by western Kentucky. In 1942, tons per man in western Kentucky averaged 6.51 per shift; in 1951, the average was 14.24 tons per man per shift—an increase of 118.8%. In this connection it might be pointed out that highly favorable natural and other conditions are not the answer to this rise in efficiency. The region has some advantages, it is true, but it has disadvantages also, and even conceding a balance on the favorable side it is not great enough to account for but a small portion of the gain that has been made.

A look at what has happened in western Kentucky reveals these significant facts:

1. Practically all the mines are new in the past 10 yr. In fact, the construction of new operations—both deep and strip—is still going on at a rapid rate.

2. Practically all the new deep mines are belt-slope operations and many employ belts for haulage underground; the others use big cars and locomotives operating over the most modern of roadbeds. All are mechanized to the hilt, predominantly with high-capacity loading machines. The accent has been on power loading and as close to continuous flow as possible from the time the coal leaves the face until it lands in the railroad car.

3. Stripping has been accepted as a routine production method for use wherever possible. And the stripping operations tend to big modern equipment throughout, including haulage units and other auxiliaries.

4. Operating management is dedicated to seeing that the equipment in

use produces at as near rated capacity as possible. This is a factor as important—if not more important—in the western Kentucky record as the investment in new mines and equipment.

Though western Kentucky stands out because of the scope and penetration of its overhaul of mining equipment and methods, this is not to say that it stands alone in the improvement it has made in its efficiency. Many individual companies have done as well or better, and the record of a number of regions compares favorably in progress.

Illinois, Indiana and Wyoming—among the first of the states to go for mechanized mining in a big way—rank among the top, as does Ohio, which also has followed the same pattern as western Kentucky in the past 10 yr. In fact, if the terrain permitted wider use of large stripping equipment and underground conditions were somewhat more favorable, Ohio's record probably would be up with western Kentucky's. In any event, all the companies and regions that have marked up the greatest progress have followed substantially the basic principles listed as the foundation of success in western Kentucky. These are, to repeat, new mines or drastic overhauls of existing operations, high-capacity stripping or mechanical-mining units, and use of equipment at as near capacity as possible.

Behind the Record

Perspective is a vital ingredient, though not the only one, in judging present position and future progress—in mining as in all other human endeavors. That is the justification for analyzing past developments and the results that have flowed from them. To round out the coal-mining picture a little more, though not necessarily completely, the following are some of the significant developments of the past 10 yr that should be listed, not necessarily either chronologically or in order of importance:

1. Wide expansion in loading with mobile machines in deep mines, paralleled or stimulated by development of loading machines and companion equipment for even the thinnest seams.

2. The advent and establishment of the continuous miner as a production tool with real possibilities.

3. Development of equipment and systems that more nearly approach the goal of continuous coal transportation, thus making possible nearly automatic continuous flow from solid face to the railroad car.

4. The beginning of longwall mining with new-type machines also in the continuous-mining category.

5. The beginning of longhole drilling and shooting in pitch mining in the anthracite field.

6. Roof-bolting.

7. The advent and establishment of remote-mining equipment and methods—the big auger and the remotely controlled miner, in addition to the longhole drill for pitch work.

8. Introduction of the 50-yd dipper and widespread adoption of large walking draglines in stripping, accompanied by higher-capacity longer-range shovels and draglines—a large number powered by internal-combustion engines—in the less-than-10-yd group widely employed in contour or hillside stripping.

9. Major growth in deep stripping and spoil haulage in anthracite.

10. Major advances in the capacity of overburden drills, particularly of the vertical type, and of coal-haulage units.

Diesel power for underground use, particularly in main haulage, is another recent development but still faces the roadblocks set up by the safety code and the recent decision of the West Virginia Supreme Court. Along with this and other major items go a number largely in the field of operating materials and supplies, though some equipment is involved. In the aggregate, they represent a significant contribution to labor-conservation and cost reduction. Examples include:

1. Mine jeeps and personnel carriers, powered supply trucks and powered maintenance units.

2. Carbide-tipped bits. The continuous miner, as a case in point, is made possible only because metallurgical progress has produced bit materials that can stand the strain of breaking coal out of the solid.

3. High-strength steel alloys for weight reduction and also, in the proper specifications, resistance to corrosion and abrasion. Stainless steel for screens, chutes and the like is an example.

4. Hard-surfacing materials for wear resistance; special metals and alloys for corrosion resistance in such services as pumping.

5. Asbestos-cement, plastic and aluminum pipe for drainage. In addition to providing corrosion resistance, pipes of these materials can be handled with much less labor and can be installed in a fraction of the time. With metal pipe, new quick couplings also reduce installation time to a fraction of the former figure.

6. Plastic sheet and inflatable plastic bags for better temporary stoppings that can be erected with greatly reduced labor. Parallel developments are plastic sprays and paints for rendering stoppings airtight and protecting roof.

7. Prefabricated steel buildings to cut erection and moving cost.

8. Automatic couplings for mine cars.

9. Automatic caging and dumping equipment, as well as automatic equipment for feeding mine cars and trips past loading points in the mine or outside.

10. Automatic controls for fans, pumps and substations.

11. Power equipment for handling materials and supplies in mine yards, shops and storage buildings.

The list of both major and minor developments could be expanded at length, with additional examples continuing to show that progress in the past 10 yr reflects the following:

1. Wider use of machines and modern materials.

2. Better use of machines and modern materials.

3. Better maintenance methods and equipment to keep machines in operation as nearly continuously as possible.

Over all, the concentration is on conserving manpower by substituting machine power.

Building for the Future

The record shows that coal's billion-dollar expenditure for direct operating equipment in the past 10 yr, plus its earlier investments and the engineering and managerial talent applied to getting more out of producing facilities, has paid off fairly handsomely. But a few questions naturally arise:

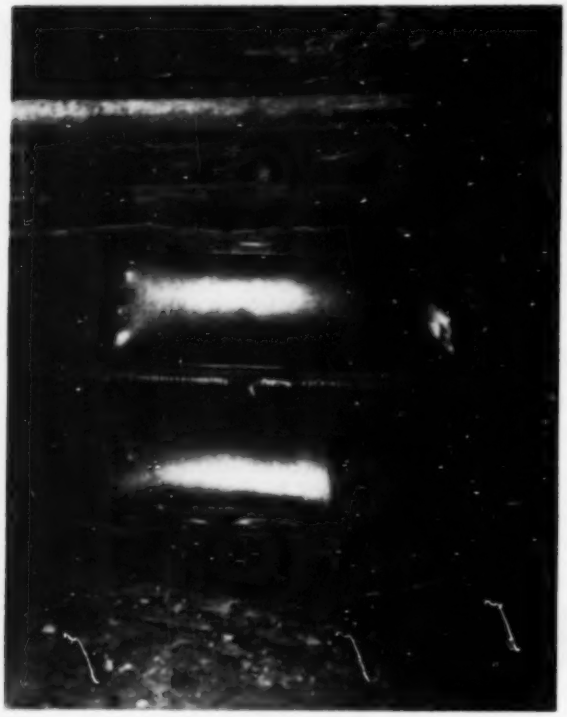
1. What point has coal reached in raising its efficiency?

2. What can be done by additional expenditures?

3. What can be done without additional expenditures?

Along with other measures, labor percentage in the mine price is perhaps one way of measuring the achievements of past years in raising efficiency. That percentage is now down to 45 to 55%, compared to 65 to 75% before World War II. Although the comparison may not be strictly accurate, the percentage of labor cost in the prices of many other products at the plant door usually is 15% to 25%. In any event, the labor percentage in coal's prices is still large enough to leave considerable elbow room for reduction in the future.

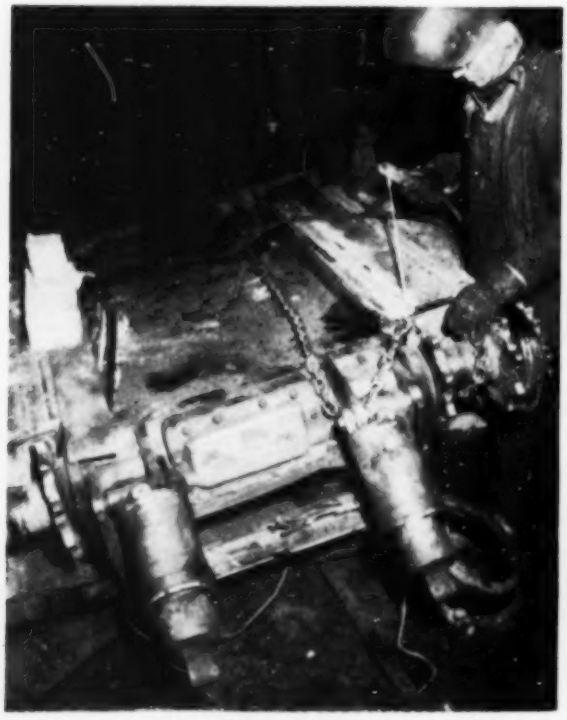
Substituting machine power for manpower, to repeat, still is the royal road to low cost. The machines are available or are being developed for



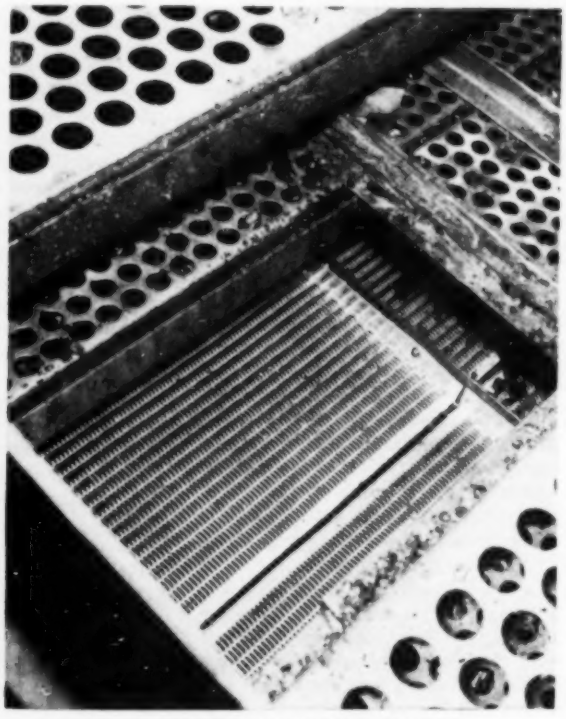
1. PLASTIC FOR STOPPINGS

2. PLASTIC PIPE

LINE-BACKERS IN MINING—Cost-cutters in themselves, these supply and supply-handling items are among the many that also enable machines to reach new efficiencies.

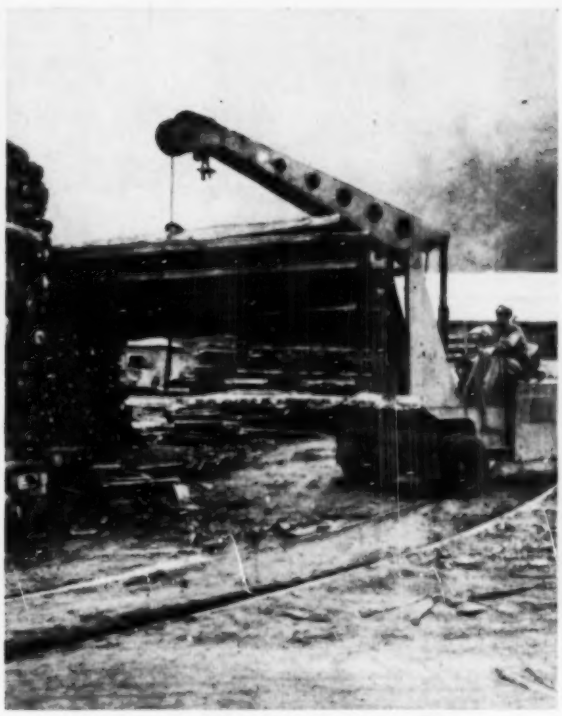


3. HARD-SURFACING



4. ALLOYS FOR LONGER LIFE

5. POWER TOOLS



6. SUPPLY-HANDLING CRANE

early use. Would, therefore, the investment of another billion dollars produce equal results? Perhaps not quite as great, considering that the dollar buys less today, but the reduction in labor cost certainly would be significant. And, as the industry gets closer to fully automatic continuous-flow production and thereby reduces manpower to a minimum, the closer it will get to rock bottom in cost—and likewise to a dominant competitive position. This arises from the fact that coal's competitors already are largely laborless, and thus have little opportunity to get their costs below present levels. In fact, they will have difficulty keeping them from rising to substantially higher levels in the future.

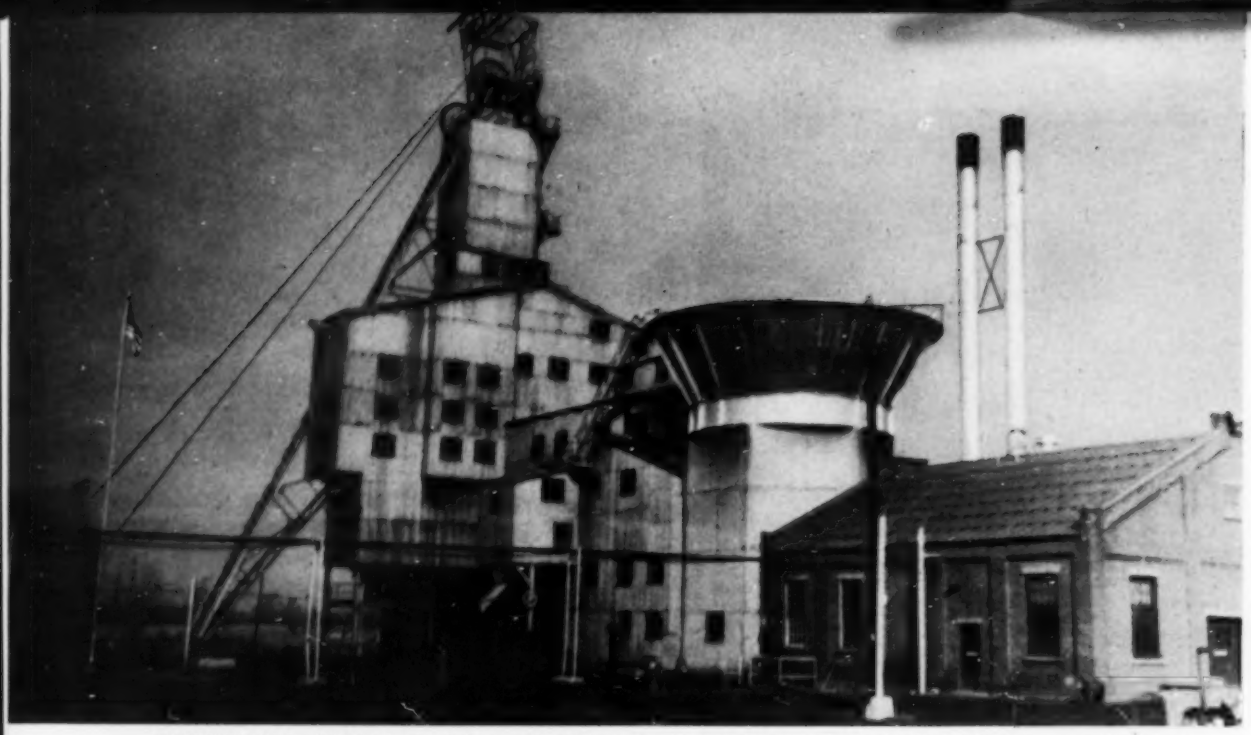
To get a little more down to cases, enough experience has been gained from underground machines now in existence to make it reasonably sure that an investment of $600,000 to $700,000 will permit mining and delivering to the preparation-plant hopper 1,000 tons per day of three shifts with a total of 30 to 35 men, including electricians and other service men. Under favorable conditions, the total can rise to 1,500 tons or more; under adverse conditions it still will be perhaps 600 to 750 tons. In fact, a number of new and modern deep mines already are in the high range or close to it.

At this stage in mechanical production—almost completely automatic and continuous-flow — some interesting changes take place in the relative standings of the cost items. If a $600,000 unit is written off in 10 yr, during which time it produces 2,000,000 tons of coal, the depreciation charge becomes 30c per ton, compared to possibly 50 or 60c for direct labor to the plant hopper. In addition, maintenance becomes a key factor in the operation, since to get the desired return from an investment of this magnitude only the bare minimum of delays can be tolerated. Thus, the equipment must be kept in tiptop condition.

Concentration on the benefits of additional expenditures, however, should not be permitted to relegate to the background another very important factor in attaining high efficiency and low cost—a factor as important with equipment already in service as with new equipment that will be bought in the future. The fact that the machine of itself provides an appreciable increase in tons per man often leads to overlooking the fact that the results would be even better if the machine were given a better chance. If a loader, for example, is not at work actually producing coal at least 50% of the shift, the chances are good that it is not performing at its best, with adverse effect on cost.

In any event, thorough checking of machine performance and delays is a good rule. Here is where time studies come in. Frequently, these studies will show that a significant increase can be obtained with no additional equipment. Even if new or additional equipment is necessary, the cost sometimes is relatively small in relation to the increased output per machine and per man. Numerous mining operations have shown that efficiency can be raised up to 50% or more with little or no expenditure by proper attention to maintenance, transportation, timbering and other factors affecting loader operation.

The record in the coal-mining industry proves that machines properly operated can cut cost substantially—and furthermore that additional cuts of equal or greater magnitude are possible. In fact, the day when a significant portion of the Nation's tonnage can be mined without men going back in the working places is in sight—as well as the day when telemetering, television and automatic controls will make it possible to operate a complete preparation plant with one or two men. It will take money, and engineering and managerial brain sweat, but it can be done, thereby really putting coal out in front in the fuels and energy race.



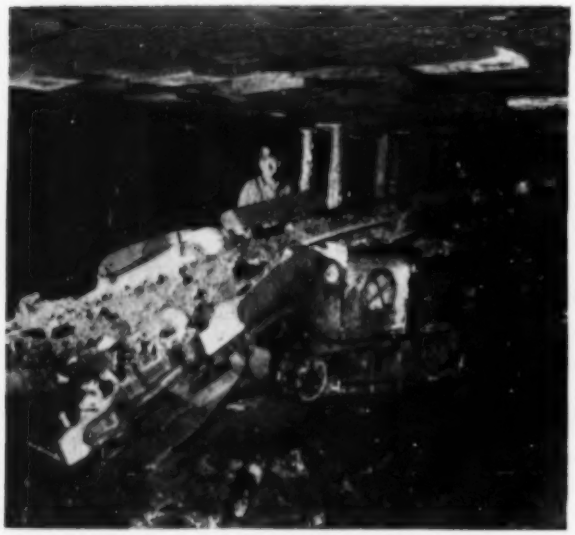
TEAMING UP with efficient mining methods for a quality product at Enoco is this 560-tph preparation plant.

Enoco Builds for the Future

. . . By spending money to make money
. . . By applying modern production methods
. . . By making maintenance work

By A. E. FLOWERS, Assistant Editor, Coal Age

EFFICIENT PRODUCTION of 6,000 tons of clean coal per day at the Enoco mine of Enoco Collieries, Inc., Bruceville, Ind., a subsidiary of the Enos Coal Mining Co., is a product of definite steps based on careful study of conditions and possibilities. To date



TYPICAL OF THE MODERN EQUIPMENT installed underground at Enoco are large high-capacity loading machines (left) used in thick-coal areas. When thin coal areas are encountered, low-type equipment takes over. All-steel covered man-trip cars transport men from the shaft bottom to the working areas.

How Enoco Goes After Mining Efficiency

This tabulation shows 20 steps to higher output and increased efficiency at Enoco. They stemmed from a basic decision by management to proceed on facts. As a result, a series of time studies were made of each phase of the operation to pinpoint weaknesses and indicate corrective measures. These 20 steps followed, and others will be taken in the future.

1. Tungsten-carbide bits were installed on all cutting machines to reduce bit cost and eliminate two bit sharpeners in the shop.

2. Feed speed on cutting machines were increased to permit faster sumping and cutting.

3. Although Items 1 and 2 increased cutting-machine output, they still could not cut enough coal for the loading machines. Cutterbars were then increased from 7 to 9 ft.

4. Maintenance crews were added on the third shift to perform all maintenance work on section equipment. Only emergency work and routine inspection is now done on producing shifts.

5. Lubrication of mining equipment was added to third-shift maintenance to supplement on-shift greasing.

6. Spare equipment was made available underground for use when regular equipment is being overhauled or in event of breakdown.

7. A complete underground shop was put into operation for repair of all underground equipment.

8. A tunnel was driven to eliminate a severe grade near the shaft bottom. Grades on main haulage are now held to a maximum of 2% against loads and 2½% with.

9. Roof-bolting was added for better roof control.

10. Special timber cars were designed and built to eliminate hand loading and unloading of timbers at the shaft. Now timbers go direct from the supply yard to the working area.

11. Timbering machines were added to facilitate setting of crossbars in areas of exceptionally bad top. Electric saws are provided for all units.

12. Installation of trolleyphones was completed on all haulage units and at key surface stations.

13. Sound-powered phones were installed in all working sections.

14. A tipple communication system was added to up preparation efficiency and save manpower.

15. Well-planned maps were made for all mine sections. All foremen work from plans provided by the engineering department. Room depths were reduced from 400 ft to 350 ft to increase haulage efficiency.

16. Four battery shuttle cars were converted to cable reel because of excessive grades. Airplane-type brakes were installed on all 32E, 42E and 42D shuttle cars.

17. To improve face preparation, bugdusters were installed on universal cutting machines. Sprinkling systems were also installed on these machines.

18. Face preparation was also improved by changing 260-cu in Airdox shells requiring 3½-in holes to 325-cu in shells requiring 2½-in holes.

19. The storage bin at the shaft bottom was lined with metal and a long breaker bar was installed in the bin to improve automatic skip loading.

20. The hoist motor generator and control were adjusted to handle 12-ton skip loads rather than 8 or 9 tons.

these steps number 20, with others planned. Results, among other things, include an average of 325 tons per loading machine per shift under conditions somewhat less than favorable.

Seeking new opportunities for expansion, the present owners became interested in the Enoco mine early in 1948. J. H. Fletcher, consulting engineer, Chicago, was commissioned to make an investigation and evaluation of the property and on the basis of his recommendation the property was purchased in October, 1948. Mr. Fletcher continues as consultant and takes an active part in Enoco's planning. John A. Stachura was appointed general superintendent of the newly-purchased property and plans were immediately put into action to increase production and apply modern methods. As a result, efficiency has been increased and Enoco mine has attained a high rank among the Indiana producers.

Management of the Enoco Collieries is headed by Fred S. McConnell, chairman of the board and George E. Enos, president. Mr. Stachura, as noted, is general superintendent. Other key men are: Raymond Winegar, underground superintendent; Heber Conrad, outside foreman and preparation manager; Eugene Stacey, electrical engineer; Elmo Jordan, mine foreman; Roy Kattman, chief engineer; Robert Eskew, mining engineer; Grover Friley, second-shift chief electrician; James McGlone, second-shift outside foreman.

MINING AT ENOCO

Mining operations are in the Indiana No. 5 seam which is irregular in thickness at Enoco, ranging from 5 to 8 ft. The seam contains no bands of rock but pyrite makes cutting difficult and bit wear rapid. Overlying the coal is a very friable shale which requires close support at all times. The bottom is a firm shale and drainage is not a problem as all underground workings are dry.

Main entries and room panels are developed on 45-ft centers in groups of four. Room panels are driven 1,505 ft deep in areas of good top, with 27 rooms projected on 50-ft centers on each side of the entries. In areas of bad top, room panels are driven 1,470 ft deep and rooms are driven on 45-ft centers. All rooms are driven 350 ft deep and a 155-ft barrier pillar is left between the first room and the main entry.

Rooms, turned at 90 deg, are developed in groups of nine with the fifth room serving as a key room and haulway. Crosscuts lead from the key room at 60 deg to speed shuttle-car haulage. To concentrate mining areas, get maximum efficiency from haulage crews and insure better supervision, two loading units are assigned to each room panel. Each unit works nine rooms on opposite sides of the entry and has a separate loading ramp for shuttle cars to dump into 6-ton drop-bottom mine cars.

CREWS AND EQUIPMENT

Nine off-track loading units, five in the east area and four in the west, produce the coal at Enoco. All units work two shifts, with two assigned to third-shift production to supplement the double-shift production. Average

MINE CARS are loaded from both sides of the track by shuttle cars discharging from ramp positions.

TWO-MAN BOLTING CREWS install 80 to 180 roof bolts per shift with this rotary unit. Bolts are on 4-ft centers.

Underground Equipment

Loading Machines
1 Joy 14-BU, 220-v AC
5 Joy 11-BU, 220-v AC (1 spare)
4 Joy 11BU, 275-v DC
1 Joy 14-BU, 220-v AC (spare)
1 Joy 14-BU, 275-v DC (spare)
1 Joy 5-BU, 275-v DC road digger

Shuttle Cars
9 Joy 10-SC
1 Joy 42E
3 Joy 42D converted
8 Joy 32E (2 spares)

Cutting Machines
5 Goodman 512 with bugdusters, 220-v AC on Joy T2 trucks
4 Joy 10-RU, 275-v DC
Cincinnati and Bowdil chains
Kennemetal bits

Drills
9 Dooley 580 twin-boom, rubber-mounted
Hardsocg and Coalmaster 2¾-in augers
Kennametal and Coalmaster bits

Blasting
Airdox at 11,500 psi

Roof-Bolting
7 Fletcher self-propelled hydraulic rotary drills
Bethlehem Steel Bolts
Bethlehem Steel and Ohio Brass expansion shells

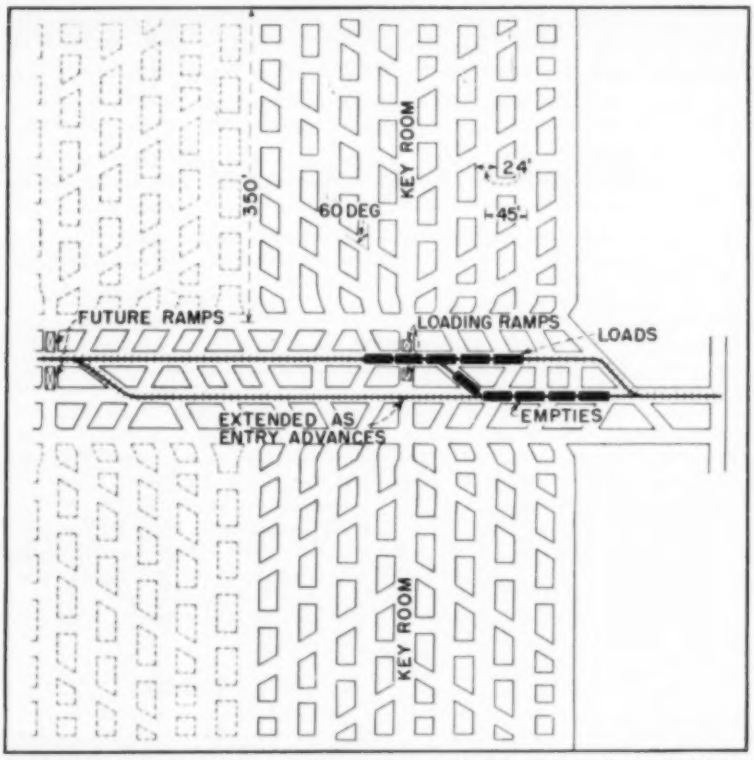
Timber Setters
Baker rubber-tired, self-propelled; with Exide Ironclad batteries

Mine Cars
ACF, 6-ton 3-door dropbottom

Locomotives
Main haulage—Jeffrey, two 15-ton, one 13-ton, one 10-ton
Section haulage—Goodman, General Electric, 8-, 10- and 13-ton

Substations
2 General Electric 200-kw m-g sets
1 300-kw General Electric m-g set
2 General Electric 300-kw rectifiers

Automatic Skip Loading
Connellsville Mfg. Co.

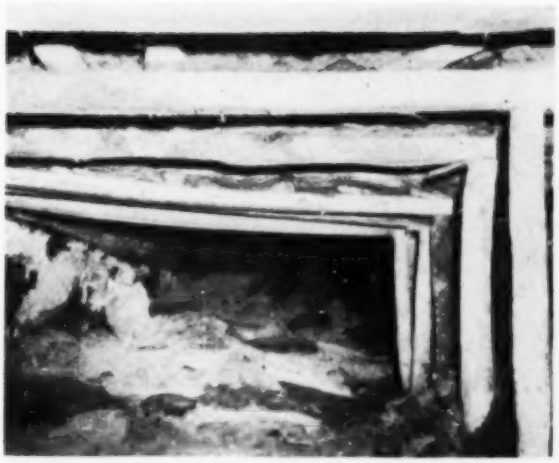


MINING PLAN concentrates working places and haulage. Two units, each driving nine rooms, load 6-ton mine dropbottom mine cars from both sides of the track.

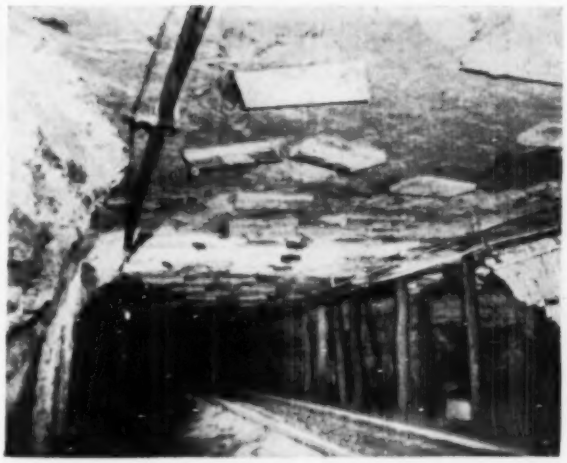
production per unit is 325 tons and where seam and roof conditions are more favorable 20 to 30% more tonnage is loaded.

Section personnel is as follows: 1 loading-machine operator; 1 cutting-machine operator; 1 cutting-machine helper; 2 shuttle-car drivers; 2 roof-bolters; 1 shotfirer; 2 drillers; 1 mucker; 1 motorman; 1 mechanic; and 1 section foreman; a total of 14.

Uneven thickness of coal made it necessary for Enoco to have section equipment available for both thick and thin areas. As a result, present equipment is divided evenly between high and low types. A typical thick-coal section is equipped with a Joy 11-BU loader, 10-RU cutting machine, two 10-SC shuttle cars, Fletcher roof-



PAST ROOF-SUPPORT METHOD was to set crossbars on close centers. When bars rotted, large falls resulted.



PRESENT SUPPORT METHOD is to install roof bolts with an 18x12x2-in wood header for more bearing area.

bolting drill and a Dooley twin-boom rubber-mounted coal drill. A Joy 14-BU loader and a Goodman 512 short-wall cutting machine with bugduster are substituted for the larger loader and cutter in the thin-coal areas.

Cutting and drilling in the Indiana No. 5 seam is relatively difficult, requiring tungsten-carbide-tipped bits for both operations. All coal is undercut to a depth of 9 ft and, where universal machines are used, an additional center wedge is cut in the coal immediately above the kerf. Outline of the wedge is an equilateral triangle with one 2½-ft side being the kerf. This additional cutting permits easier shooting and better face preparation. Each machine cuts 12 to 15 places per shift.

In 16-ft headings, three rows of four holes each are drilled per cut. Room cuts, 24 ft wide, require 15 to 20 holes. All coal is broken with Airdox, delivered to the faces at 11,500 psi. An air line is laid in each room so that the shotfirer has a minimum of distance to travel.

Loading machines deliver coal to shuttle cars which carry it to loading ramps for transfer to 6-ton three-door dropbottom mine cars. Cars are loaded in trips of five and are handled on the section by 8-, 10- and 13-ton locomotives. Track is laid in Headings 2 and 3 and is connected with crossovers to provide fast and easy trip changes. Main haulage is handled by 10-, 13- and 15-ton locomotives, which leave 25 empties and pick up 25 loads at sidetracks and deliver them to a 250-ton bin at the shaft bottom. Two locomotives, one at each end of the trip, are employed on all haulage. This eliminates the need for tripriders and prevents cars from running away in case of a coupling failure. All locomotives are equipped with Femco trolleyphones to facilitate communication between motormen and the dispatcher. Coal from the underground bin is delivered to 12-ton skips for hoisting to the preparation plant.

FUTURE POSSIBILITY is roof coating after the bolts are installed, to prevent spalling around bolts. Headers will be eliminated if successful.

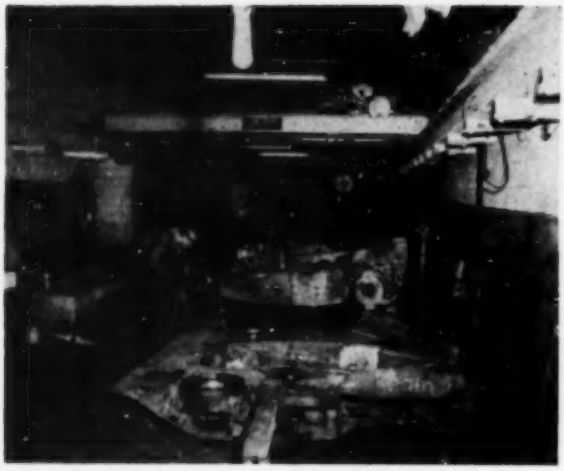
ROOF CONTROL

Roof-bolting has been a major factor in improving the safety record and increasing production per loading unit at Enoco. Over 30 mi of entry has been bolted with only a few cases of failure. There have been no injuries resulting from falls in bolted areas.

Seven Fletcher rubber-mounted hydraulic rotary drills, each operated by a two-man crew, perform bolting duties on mine sections. A tightening device, dust collector, hydraulic jack for raising crossbars, and a hydraulic-powered saw for cutting timbers are incorporated in the latest-model drills. The hydraulic lifting jack and saw were added so that human effort would be at a minimum when bars were set in areas of bad top.

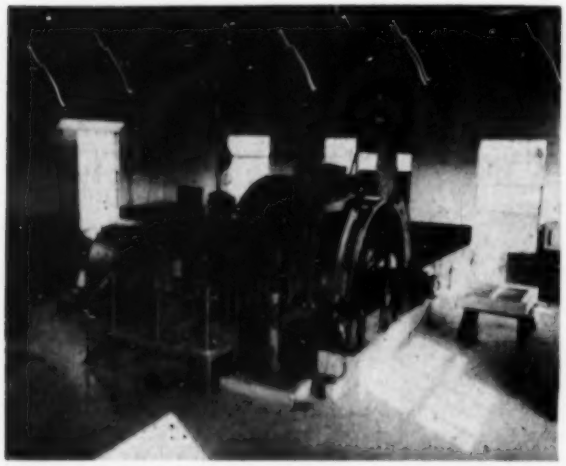
Each crew sets 80 to 180 bolts per shift, the average being 100. Wood headers, 18x12x2-in, are used with the roof bolts to provide additional support and to prevent scaling of the top. Bolt length is varied according to the thickness of the overlying soft shale, which does not provide good anchorage. Usually a 3-, 4- or 5-ft bolt is long enough to provide anchorage in the hard shale overlying the softer material.

To prevent air slacking and subsequent spalling of the roof, Enoco has sprayed several test areas with roof coating. Several types of material and equipment have been used in an attempt to find an inexpensive and effective material which can be applied quickly and cheaply. Efforts have been concentrated on developing with cooperating suppliers a material with a relatively high flash point so that sparks from the trolley wire will not ignite it, and yet has properties which will permit it to be applied with a small inexpensive spray gun. After test areas have been observed over a sufficient period of time, a decision will be made as to whether the method and equipment are effective. If the coating is successful, bolts will be installed without the wooden headers.

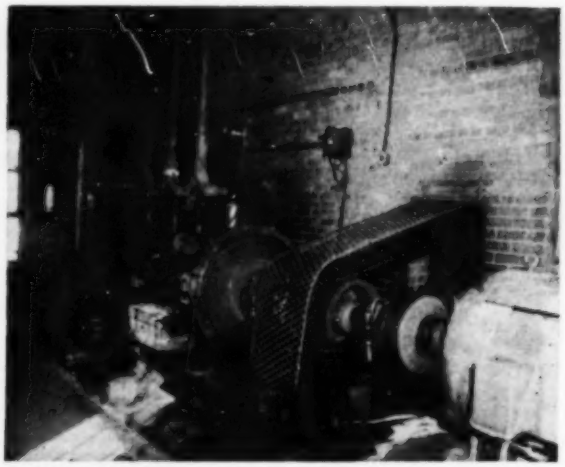


COMPLETE FACILITIES for all electrical and machine-shop repair work are incorporated in a modern underground shop. All equipment is repaired and rebuilt here.

A 250-TON BIN receives coal from 6-ton 3-door dropbottom mine cars. Two 12-ton skips, 75 ft below track level, are alternately and automatically loaded.



AUTOMATIC HOIST delivers 12-ton skips to top of preparation plant. Unit receives power from a 500-kw m-g set.



AUXILIARY 150-HP GASOLINE ENGINE is kept ready to drive the mine fan if the electric motor or the power fails.

RETURNING from an underground inspection trip are John A. Stachura (left) general superintendent, and J. H. Fletcher, consulting engineer. Other Enoco management men, right photo, include R. Eskew, mining engineer (left); E. Stacey electrical engineer; Grover Friley, second-shift electrician; J. McClone, second-shift top foreman; and Heber Conrad, top foreman.

OPERATING POWER

Power is purchased at 33,000 v and is reduced to 2,300 v for distribution to the various circuits. Power for the preparation plant is reduced to 440 v by three 1,000-kva Westinghouse dry-type transformers. Two additional transformers supply 220 v for welding and 110 v for lights and heating units.

Underground power is carried down the shaft or down boreholes by 4/0 steel-armored lead-covered cable which delivers 2,300 v to conversion equipment for DC-powered units. Where AC units are used on the section, three General Electric 37½-kva Type FK20T Pyranol transformers supply 220 v. Five substations supply DC power for haulage and DC mining equipment.

DC power circuits are made up of 6/0 trolley wire and 1,000,000-cir mil positive feeder with 70-lb bonded rails and 1,000,000-cir mil feeder serving as the return.

VENTILATION

Air for Enoco is supplied by a Jeffrey 8H Aerodyne fan delivering 166,000 cfm at a 3-in water gage and driven by a 2,300-v 150-hp Crocker Wheeler synchronous motor. In event of a power failure an auxiliary 150-hp LeRoi gasoline engine is used to drive the fan. This unit is connected to the fan by two Rawson centrifugal clutches which engage the fan and motor when the motor speed reaches 600 rpm.

Air is blown down one half of the man shaft, is split for distribution to the working areas and returns to the surface through the second half of the man shaft and also through the hoisting shaft.

HOISTING

Coal is delivered to the shaft bottom in 25-car trips which are dumped into a 250-ton storage bin. At the bottom of the bin, 75 ft below the dumping level, coal is delivered alternately and automatically to two 12-ton skips which deliver 560 tons of raw coal per hour to the preparation plant.

Hoisting of skips is handled by a fully-automatic Allis-Chalmers hoist. A 500-kw Allis-Chalmers m-g set supplies DC to the 600-hp 250-v 300-rpm shunt-wound hoist motor. Hoist drums are wound with 820 and 835 ft of 1⅞-in steel rope.

MAINTENANCE

Enoco's maintenance program is set up to help production crews achieve maximum production with a minimum of breakdowns. To keep section equipment in top operating condition, all maintenance work, except emergency repairs and routine jobs, is done on the third shift. The entire maintenance program is directed toward getting full production during the coal-producing shifts.

One mechanic is assigned to each section to handle routine inspections, minor repairs and lubrication during the working shift. One supervisor is in charge of all face equipment, and one day and one night foremen are assigned to the underground shop to supervise all electrical and machine-shop work. All repair work except armature winding is done underground—a practice which speeds overhaul jobs and saves hoisting heavy equipment to the surface.

Major maintenance work is performed on the third shift by a special 9-man crew. These men are assigned to repair equipment which has been noted by the section mechanics as needing major attention to prevent loss of production. Spare equipment, kept in top operating condition, is sent to the section if the third-shift crew finds that repairs cannot be made in one shift.

A surface shop handles all repair work for the preparation plant, as well as blacksmith work and miscellaneous surface work.

PREPARATION

Coinciding with Enoco's purchase of the property was the completion of the Link-Belt preparation plant in October, 1948. Incorporating primary crushing, two air-pulsated jigs and two CMI driers for 3/16x0 coal, the new plant handles 550 tph of raw coal containing approximately 10% reject. Keeping in step with Enoco's search for new methods, a new experimental CMI water-clarification system is now being tested. First of its kind installed in the coal industry, the clarification equipment is designed to recover fine solids from wash water and permit the plant to operate with a closed system. Stream-pollution problems will be practically eliminated when the equipment is operating full-time.

Preparation-plant labor, totaling 11, are as follows: 1 boom operator who controls car retarders, transfer of cars under the tipple and freeze-proofing equipment; 2 greasers and preparation men who handle lubrication and are responsible for sizing, blending and treating; 1 wash-box operator responsible for tipple operation and wash-box controls; 1 fine-coal plant man whose duties are to operate pumps, screens and water supply; and six car droppers and car cleaners.

Skip-hoisted R-O-M coal from beneath a hopper at the top of the tipple is delivered by a Link-Belt 60-in feeder to a 5x10-ft Allis-Chalmers Ripl-Flo vibrating screen which separates the feed into plus and minus 7 in. Oversize passes to a 9x14-ft Pennsylvania Crusher Co. Bradford breaker which reduces it to minus 3 in. Refuse passes by chute directly to the No. 1 refuse bin.

The breaker resultant is delivered by a 20-in Link-Belt belt conveyor to the 7x1½ product from the raw-coal screen and thence passes to the washer. Undersize from the Ripl-Flo vibrator passes to the raw-coal screens where it is separated into 7x1½ and 1½x0 fractions for delivery to two Link-Belt 5-cell Model E jigs. Clean coal from both jigs is delivered to an 8x40-ft triple-deck primary sizing screen, for separation into plus 1¼-in, 1¼x¾, ¾x⅜, ⅜x3/16 and 3/16x0. Plus 1¼-in passes to a 6x36-ft single-deck dewatering screen which separates it into 7x4, 4x2 and 2x1¼ sizes.

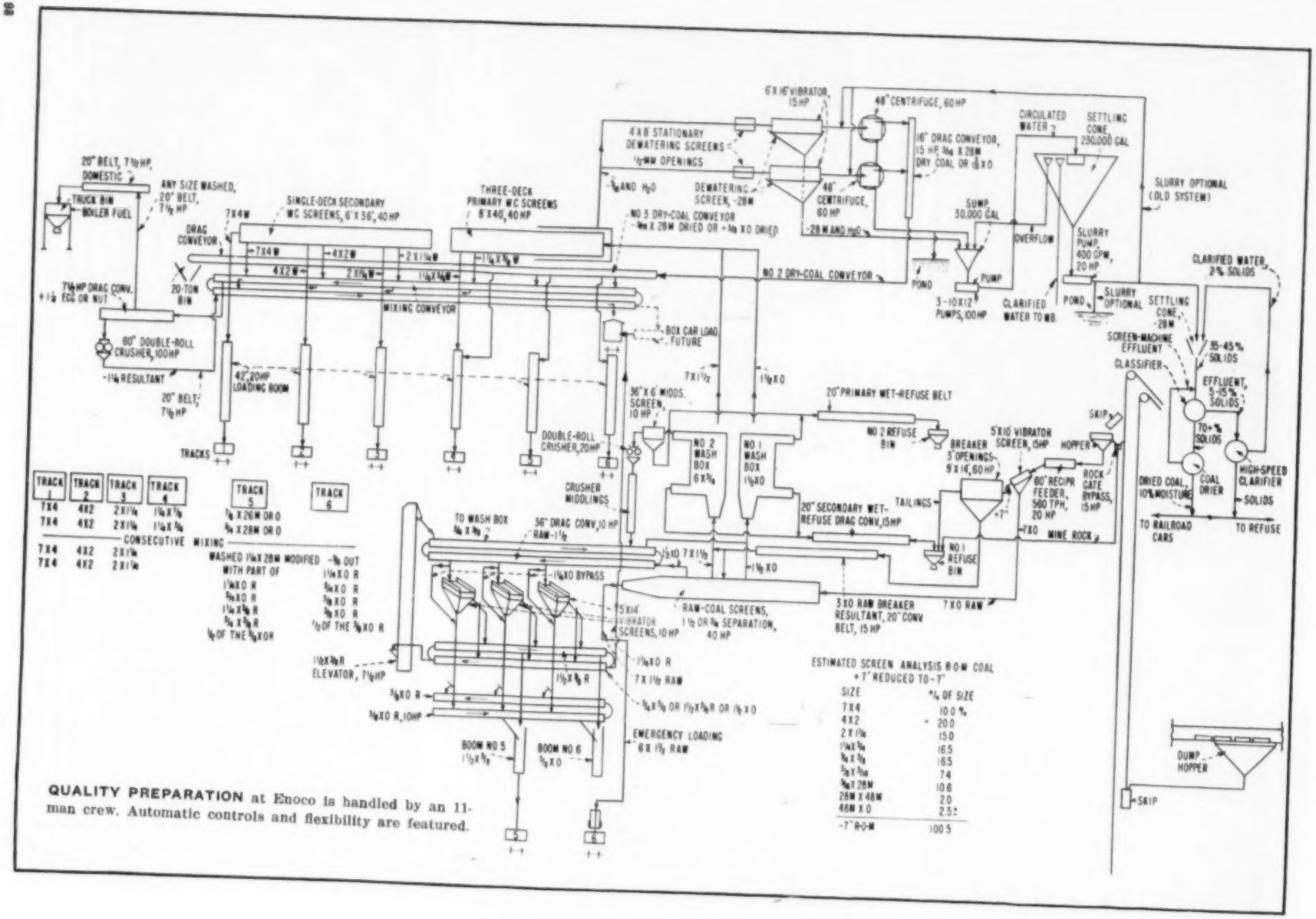
Middlings from the coarse-coal washer pass over a 3x6-ft Link-Belt positive-action vibrating screen which separates it into plus ⅛-in and minus ⅛-in fractions. The under product is deposited on a 20-in primary wet-refuse belt and is delivered to the No. 2 refuse bin. Oversize middlings are chuted to a Link-Belt double-roll crusher which breaks it to ¾x0. The resultant is recirculated to the jig.

Wet 3/16x0 coal resultant from the primary washed-coal screen is divided in half and passes over two Bixby-Zimmer dewatering screens with ½-mm openings. Two 6x16-ft Allis-Chalmers Low Head vibrators separate this partially dewatered product into 3/16x28M and minus 28M. The coarser product passes to two CMI standard coal driers which remove 75 gpm of water from the clean coal. The dry product discharges to a 16-in dry-coal drag conveyor which delivers it to the No. 3 dry-coal conveyor for distribution and loading into railroad cars.

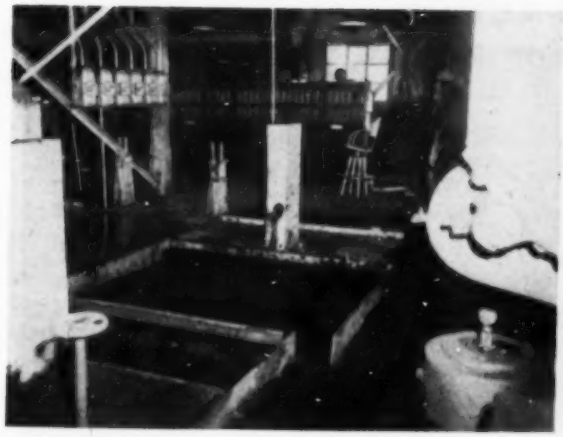
WATER CLARIFICATION

Minus 28M underflow from the two Low Head vibrators and slurry from the CMI centrifuges is piped to a 30,000-gal sump, from which two 10x12CW Allis-Chalmers centrifugal pumps deliver 400 gpm each of this slurry to a 230,000-gal settling cone. Clarified overflow water is recirculated to the wash boxes and slurry from the bottom of the settling cone is pumped by a 4x5 Allis-Chalmers 400-gpm centrifugal slurry pump to a 900-gal secondary setting cone. Slimes and clays remain in the upper part of the cone and are floated off to a settling pond.

Underflow, containing 35 to 45%

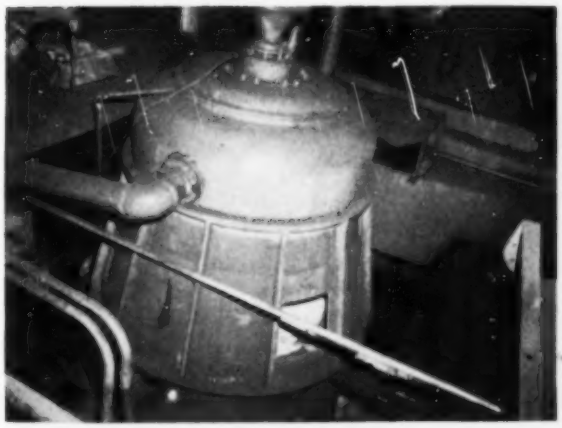

20" BELT, 7½ HP, DOMESTIC
TRUCK BIN BOILER FUEL
ANY SIZE WASHED, 20" BELT, 7½ HP
DRAG CONVEYOR
7X4W
SINGLE-DECK SECONDARY WC SCREENS, 6' X 36', 40 HP
THREE-DECK PRIMARY WC SCREENS 8' X 40, 40 HP
4X8 STATIONARY DEWATERING SCREENS ½" SQ OPENINGS
6' X 16' VIBRATOR, 15 HP
48" CENTRIFUGE, 60 HP
16" DRAG CONVEYOR, 15 HP, ⅜ X 28M DRY COAL OR ⅜ X 0
CIRCULATED WATER
SETTLING CONE, 230,000 GAL
SLURRY OPTIONAL (OLD SYSTEM)
DEWATERING SCREEN, -28M
-28M AND H2O
NO 3 DRY-COAL CONVEYOR ⅜" X 28M DRIED OR +⅜ X 0 DRIED
SUMP, 30,000 GAL
OVERFLOW
SLURRY PUMP, 400 GPM, 20 HP
POND
PUMP
3-10X12 PUMPS, 100 HP
CLARIFIED WATER TO MB
CLARIFIED WATER, 2% SOLIDS
SLURRY OPTIONAL SETTLING CONE, -28M
NO 2 DRY-COAL CONVEYOR
7½ HP DRAG CONV. +1½ EGG OR NUT
20-TON BIN
MIXING CONVEYOR
BOX CAR LOAD FUTURE
60" DOUBLE-ROLL CRUSHER, 100 HP
-1¼ RESULTANT
20" BELT, 7½ HP
42", 20 HP LOADING BOOM
TRACKS
7X1½
1½ X 0
36" X 6' MIDDS. SCREEN, 10 HP
20" PRIMARY WET-REFUSE BELT
SCREEN-MACHINE EFFLUENT
CLASSIFIER
35-45% SOLIDS
EFFLUENT, 5-15% SOLIDS
SKIP
HOPPER
5'X10' VIBRATOR SCREEN, 15HP
NO 2 REFUSE BIN
NO 2 WASH BOX 6 X ¾
NO 1 WASH BOX 1½ X 0
DOUBLE-ROLL CRUSHER, 20 HP
CRUSHER MIDDLINGS
BREAKER 3" OPENINGS 9'X 14', 60 HP
60" RECIPR FEEDER, 560 TPH, 20 HP
ROCK GATE BYPASS, 15 HP
70+% SOLIDS
DRIED COAL, 10% MOISTURE
COAL DRIER
HIGH-SPEED CLARIFIER
SOLIDS
TO RAILROAD CARS
TO REFUSE
TAILINGS
20" SECONDARY WET-REFUSE DRAG CONV, 15HP
7X0 MINE ROCK
NO 1 REFUSE BIN
TO WASH BOX ¾ X ⅜
36" DRAG CONV, 10 HP RAW-1½
1½ X 0 BYPASS
1½ X 0
7X1½ RAW
3 X 0 RAW BREAKER RESULTANT, 20" CONV BELT, 15 HP
7X0 RAW
5X16 VIBRATOR SCREENS, 10 HP
RAW-COAL SCREENS, 1½ OR ¾ SEPARATION, 40 HP
1½ X 0 R
7X1½ RAW
⅜ X ⅜ OR 1½ X ⅜ R OR 1½ X 0
1½ X ⅜ R
ELEVATOR, 7½ HP
⅜ X 0 R
⅜ X 0 R, 10 HP
EMERGENCY LOADING 6 X 1½ RAW
BOOM NO 5 1½ X ⅜
BOOM NO 6 ⅜ X 0
DUMP HOPPER
SKIP
TRACK 1: 7X4, 7X4
TRACK 2: 4X2, 4X2
TRACK 3: 2X1¼, 2X1¼
TRACK 4: 1¼ X ⅜, 1¼ X ⅜
CONSECUTIVE MIXING
7X4 4X2 2X1¼
7X4 4X2 2X1¼
TRACK 5: ⅜ X 28M OR 0, ¾ X 28M OR 0
TRACK 6
WASHED 1¼ X 28M MODIFIED WITH PART OF
1¼ X 0 R
¾ X 0 R
1¼ X ⅜ R
⅜ X ⅜ R
½ OF THE ¾ X 0 R
-⅜ OUT
1¼ X 0 R
¾ X 0 R
⅜ X 0 R
⅜ X 0 R
½ OF THE ¾ X 0 R
ESTIMATED SCREEN ANALYSIS R-O-M COAL +7" REDUCED TO -7"
SIZE | % OF SIZE
7X4 10.0 %
4X2 20.0
2X1¼ 15.0
1¼ X ⅜ 16.5
¾ X ⅜ 16.5
⅜ X ⅛ 7.4
⅛ X 28M 10.6
28M X 48M 2.0
48M X 0 2.5
-7" R-O-M 100.5

QUALITY PREPARATION at Enoco is handled by an 11-man crew. Automatic controls and flexibility are featured.

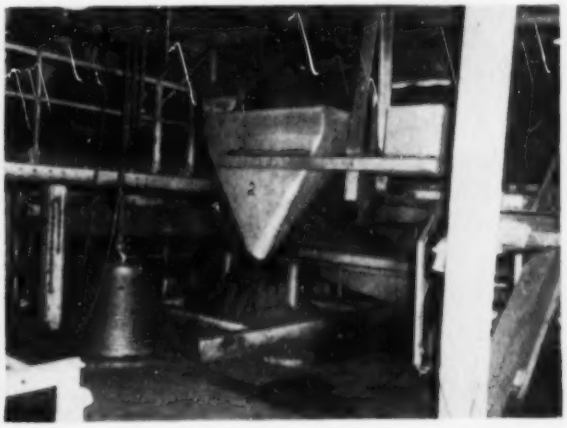


SEPARATION of rock and coal is accomplished in two 5-cell jigs. One unit cleans 7x1½ and the other 1½x0.

TWO SHAKING SCREENS size and dewater washed coal from the jigs. Fine $^{3}/_{16}$x0 coal is sent to centrifugal driers.



NEW WATER-CLARIFICATION EQUIPMENT installed in the Enoco plant is the first of its type used for this job.



CENTRIFUGAL DRIERS remove 75 gpm of water from wet $^{3}/_{16}$x0 coal. Chain hoist speeds basket change.

solids, passes to a CMI classifier which concentrates it to a 70 to 30% ratio of solids to water. This unit, consisting of a solid bowl enclosing a rotating screen, produces a uniform-pulp-density feed to the CMI centrifugal-screen machine whose job is to remove as much surface moisture as possible. This experimental centrifuge differs from the standard machine in that it has a 52-deg basket. Screen openings are 1 mm. Dried solids, containing approximately 10% moisture, are delivered in a 2-compartment conveyor to the No. 2 dry-coal conveyor or to the secondary reject conveyor. Effluent from the unit is recirculated to the CMI classifier.

Effluent from the classifier contains 5 to 15% solids and is delivered to a high-speed CMI clarifier which further clarifies the water until it contains 1½ to 2% solids. Solids from this unit are delivered to the secondary reject conveyor and the clear water is recirculated to the plant.

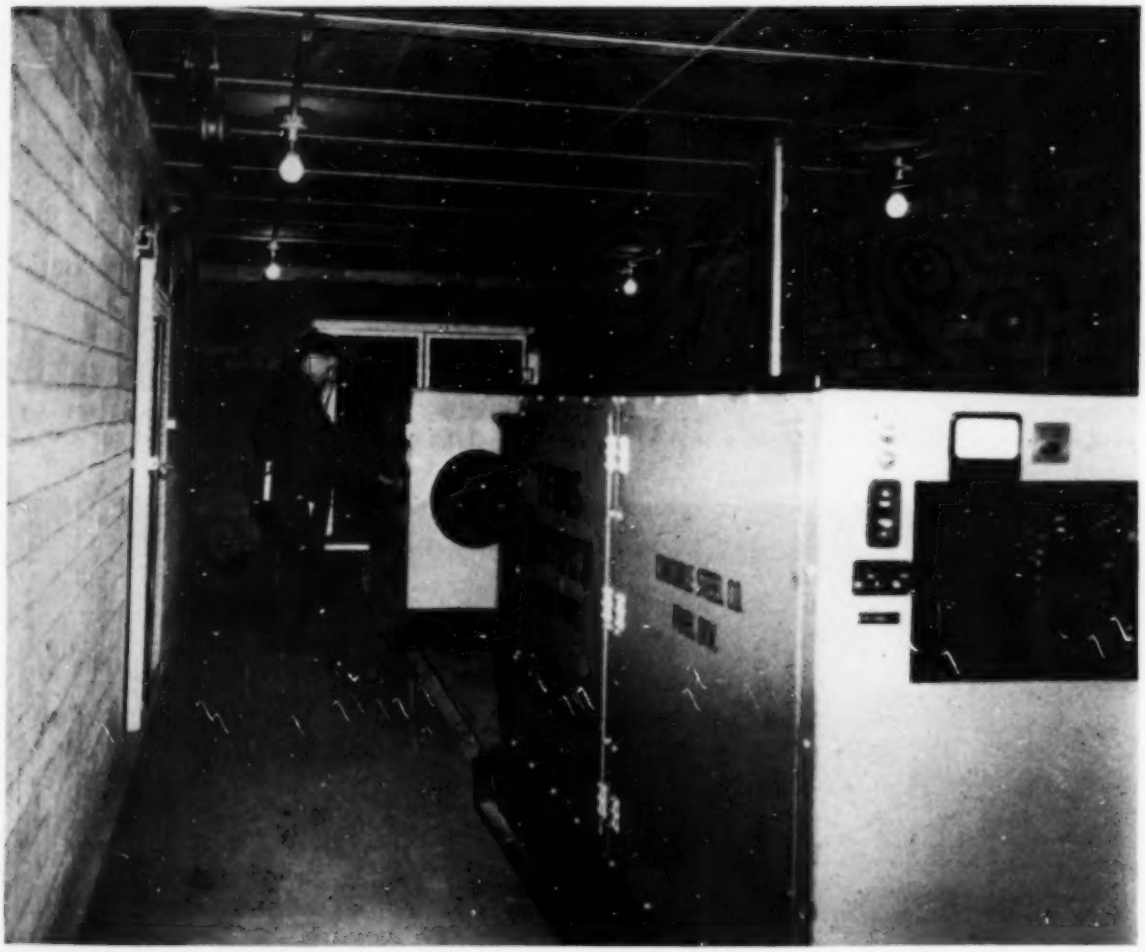
PLANT WATER SUPPLY

A 17½-acre man-made lake is the primary source of water for the preparation plant. Two Gardner-Denver 2-stage 500-gpm pumps equipped with 20-hp Westinghouse motors deliver water through 1½ mi of 5-in steel pipe and discharge it into a 10,000,000-gal reservoir. From there, two Pomona turbine pumps, driven by 40-hp Westinghouse motors, deliver 500 gpm of water to the cleaning plant.

OIL TREATING AND FREEZEPROOFING

Oil-treating facilities, designed by Max Tuttle, combustion engineer, and Heber Conrad, preparation manager, are installed on the loading booms for treating all sizes down to 3/16 in. An oil house adjacent to the tipple loading tracks is equipped with a 2-compartment 12,000-gal tank separated into 10,000- and 2,000-gal sections by a 6-in baffle. The larger serves as a storage tank while the smaller is a heated-oil supply tank. Hot oil at 200 F and 175 psi is delivered to loading booms by a Wesco 2-stage centrifugal pump powered by a 7½-hp motor and capable of delivering 30 gpm of Shell Compound F to the washed coal. Sprays, Brown-Fayro Type B45 nozzles, are arranged so that all coal is treated in suspension. Quantity of oil delivered is regulated according to the size of coal being loaded and the customer's desires. Heat for the oil is supplied by two steam coils, one at either end of the tank, receiving steam from the heating plant.

Freezeproofing is accomplished by spraying washed coal with a 33% solution of calcium chloride. Concentrated Peledow solution, purchased from the Dow Chemical Co., is delivered to the plant in tank cars and unloaded by a 200-gpm Wesco pump, which delivers it to two 20,000-gal storage tanks. A second Wesco 60-gpm pump delivers the solution to the six booms where all sizes may be treated.



NEW SELENIUM RECTIFIER in a well-built substation is one of the features of Crucible's modern power system. The car in the foreground contains transformers and the one in the background carries the selenium plates and DG switchgear.

Power Conversion With a

New portable selenium rectifier, one of the earliest high-capacity units of this type for underground service, feeds a modern power-distribution system designed for safer, more efficient operations at Crucible mine.

SAFE, ADEQUATE POWER DISTRIBUTION for concentrated machine mining is insured at Crucible mine, Crucible, Pa., through the use of a sectionalized distribution network and adequate substation capacity in seven conversion units, including a new track-mounted 300-kw selenium rectifier.

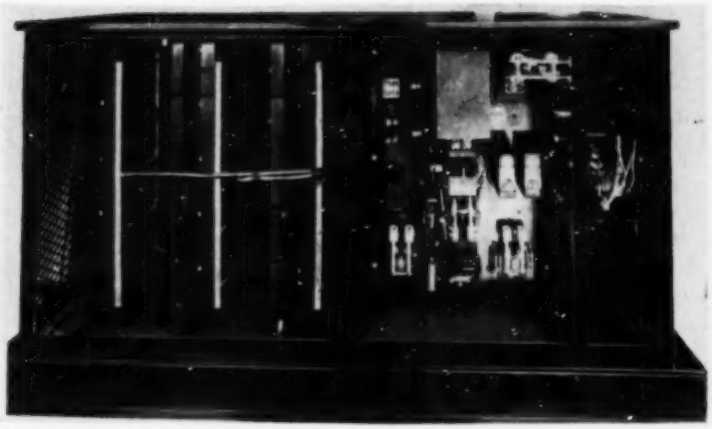
Operating in the Pittsburgh seam under the direction of officials of the Fuel Division, Crucible Steel Co. of America, the mine employs nine mining units in 26 unit shifts to satisfy production demands while maintaining the efficiency inherent in concentration of working places. Such concentration, however, leads to rapid extraction, making it mandatory that the power system be arranged to permit rapid changes in the locations of the portable substations. The substations are moved up after each 3,000 ft of advance, and on retreat will reoccupy the vaults prepared during the advance.

Some active sections of the mine now are as far as 5 mi from the foot of the hoisting slope.

NEW SELENIUM RECTIFIER

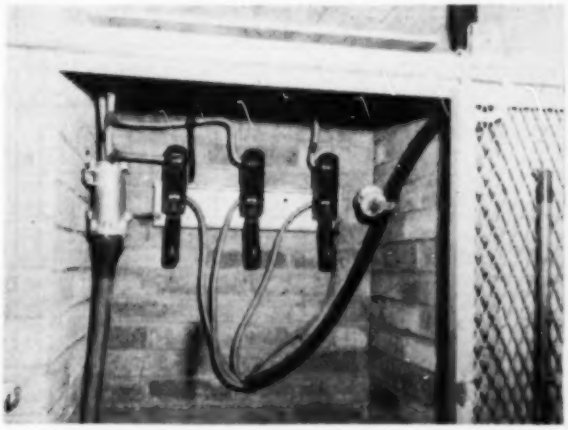
The newest feature of Crucible's power system is a dry-disk selenium rectifier manufactured by the Lewis Electric Co., New York. It works in parallel with six other 300-kw conversion units, including four m-g sets and two mercury-arc rectifiers. Three of the m-g sets are on the surface; all other conversion units are underground.

The new Lewis rectifier, according



INTERIOR VIEW OF DC CAR shows selenium stacks, protective relays and switchgear and forced draft fans for cooling.

TAP CHANGERS in AC car permit balancing input and output to mine conditions.



PHASE FUSES IN 2,300-V LINE are enclosed in a locked closet built into one wall of fireproof substation.

FIRE DOORS at both ends close automatically if heat or flame burns through twine holding latches in place.

300-KW Selenium Rectifier

to mine officials, offers the advantages of lower maintenance costs because it has no moving parts aside from a forced-draft cooling fan; it requires a minimum of attendance; it provides instantaneous full-voltage DC power when the AC side is energized, and it is readily moved from place to place.

The new conversion unit is packaged in two cars, each with wheels 6 in in diameter and with a 60-in wheelbase. Over-all dimensions of each car are: width, 50 in; length, 104 in; and height, 46 in.

The unit it rated at 300 kw, as mentioned, with 2,300-v 3-phase 60-cycle input to the transformer car and 275-v 1,100-amp DC output from the rectifier car. The rectifying stacks are assembled in a 3-phase full-wave bridge circuit.

In the matter of electrical protection, the unit is equipped on the AC side with a Westinghouse Type F-122 600-amp oil switch to protect against damage resulting from overloads in the primary circuit. The current-overload protection is provided in current tansformers with tripping relays. Protective relays also guard against phase failures.

In the DC car, electrical protection for the rectifying unit is based upon the temperature of the plates. The rectifying unit will handle unusually high overloads as long as the operating temperature of the selenium plates does not exceed 75 C. To monitor this upper temperature limit, a thermostatic relay guarding the plates initiates the interruption of the DC lines if this critical temperature ever is approached, and a forced-draft fan is employed for continuous cooling. The fan is designed to move air through the stacks of selenium plates at a rate of from 2 to 2½ times that which would result from natural convection cooling.

As an added precaution, protection from fan failure is provided by a wind switch which opens the DC breaker if the flow of air is interrupted. Protection from overloads on the DC side is inherent in the thermostatic relay, since sustained overloads from this cause would result in excessive heating of the plates. The thermostatic relay also opens the DC breaker,

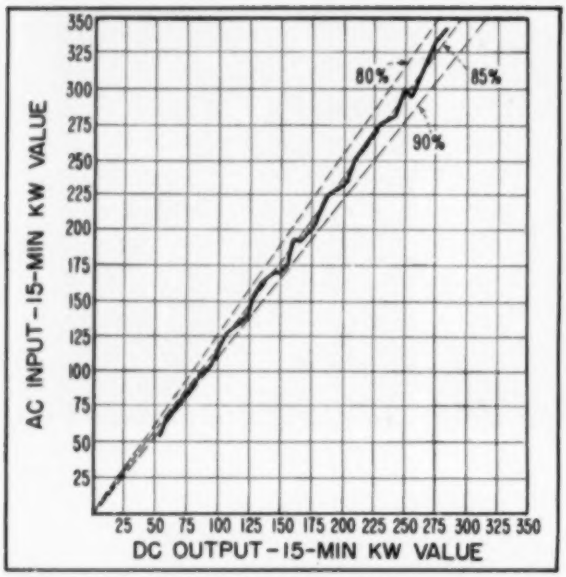


FIG. 1—**EFFICIENCY OF CONVERSION** averages 85%.

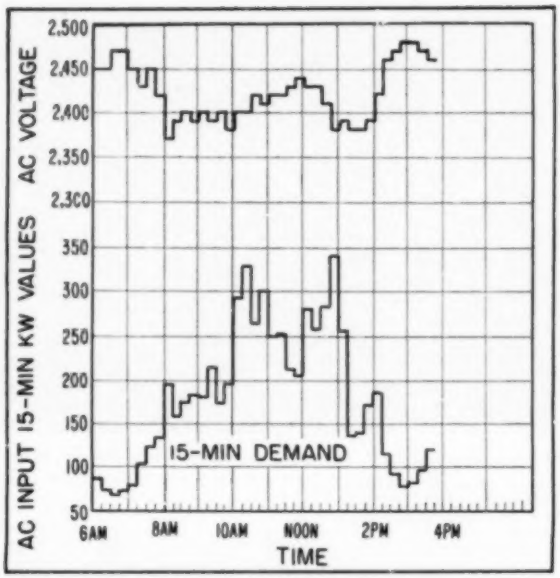


FIG. 2—**AC VOLTAGE VARIATION** under various loads.

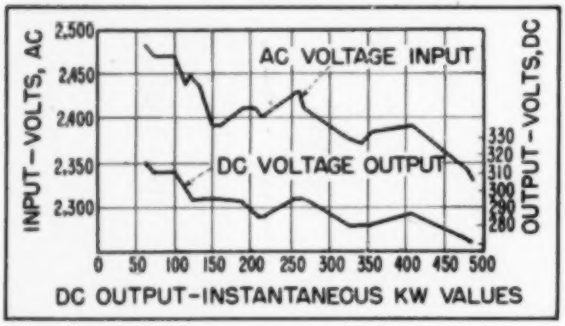


FIG. 3—**HOW LOADS** affect AC input and DC output voltage.

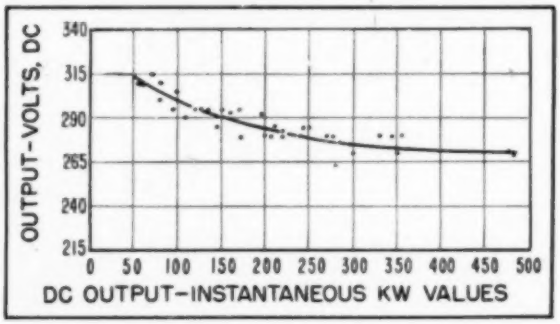


FIG. 4—**HOW DC VOLTAGE** varies under different loads.

which is an I-T-E Type KSA automatic-reclosing circuit breaker equipped with the conventional overcurrent relay and load-measuring resistor. The breaker setting is 2,400 amp.

OPERATING CHARACTERISTICS

The accompanying charts, prepared from data secured by engineers of the West Penn Power Co., suppliers of the mine power, show the in-service operating characteristics of the new rectifier.

Fig. 1 shows the over-all conversion efficiency, based upon the ratio of DC output to AC input under various load conditions.

Fig. 2 is a graphic picture of the inter-relation of AC voltage and the demand of the load as reflected in AC input to the unit.

Fig. 3. is an indication of voltage variation with load, for a short period of time when the voltage of the system was assumed to be steady, over a range of DC output from 70 kw to 480 kw. Between these limits, the AC voltage drop is 6.1% and the DC voltage drop is 14.3%, thus the net drop through the rectifier is 8.2%.

Fig. 4 shows DC voltage regulation for loads between 50 and 480 kw, or from about 20% to 160% of full load.

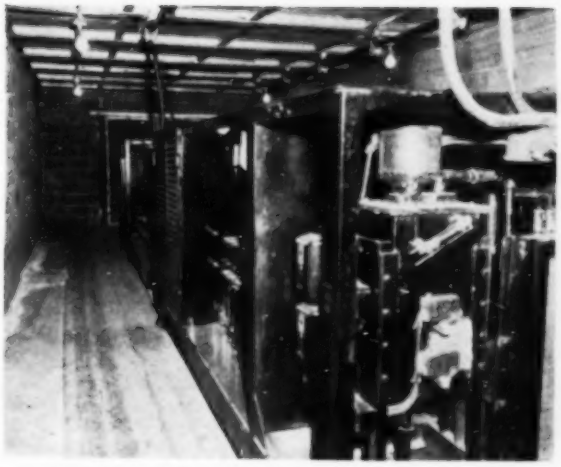
As an added feature, the transformers in the AC car are equipped with tap changers to make it possible to achieve better control over the DC output as changes occur in the distribution system. (For a review of the fundamentals of selenium rectification see *Coal Age*, May, 1952, p. 92.)

DISTRIBUTION SYSTEM LAYOUT

In designing and maintaining their power-distribution system, Crucible officials are primarily concerned with safety for the workmen, protection for the property and effective face voltage, in that order. Construction standards are high, and diligent inspection of electrical installations is a prime duty at all levels of management. This responsibility is accepted as seriously by top management, including R. S. Poister, vice president—operations, and G. E. Muns, manager of mines, as by the officials at the mine, where T. P. Latta is mine superintendent; C. B. Tillson Jr., assistant superintendent; Thomas Mark, mine foreman; Howard F. Miller, chief electrician; D. H. McKee, master mechanic; William E. Hart, safety engineer.

The step-down transformers which finally reduce the potential of the purchased power to 2,300 v AC for distribution on the property are owned and maintained by Crucible as are the pole lines carrying this power to the three surface substations and to power boreholes. The underground substations are served with 2,300 v power through borehole cables.

Underground, the byword is balance in maintaining adequate and equalized current-capacity in both sides of all circuits, and in making certain that circuit breakers in tie lines between substations are at the electrical centers of such lines.



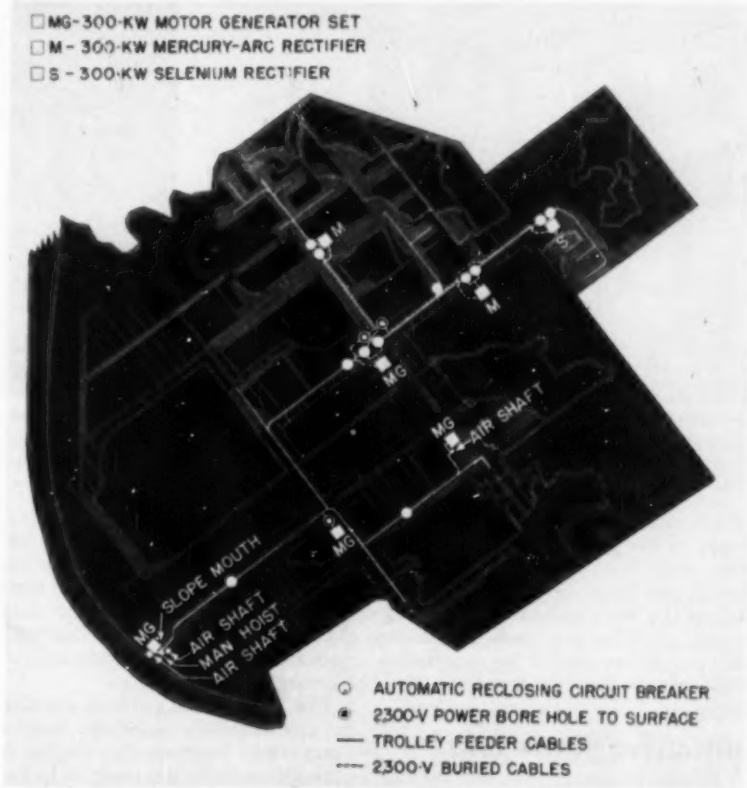
TWO MERCURY-ARC RECTIFIERS and four m-g sets operate in parallel with the new rectifier to insure adequate face voltage. Three of the m-g sets are surface installations, and all seven furnish power to underground electrical equipment.

Crucible's sectionalization of its power-distribution network conforms with recommendations set forth by an industry committee sponsored by the Bureau of Mines. The committee's recommendations are directed toward increasing protection against fires of electrical origin. Incidental but nonetheless important advantages are (1) steadier power at consistently high voltage means better machine performance and fewer breakdowns resulting from poor voltage; (2) sectionalizing circuit breakers prevent an electrical outage in one section from interfering with production in other sections and (3) the workmanlike installation of power-distribution lines practically eliminates the danger of injuries caused by electricity.

BUILDING SUBSTATIONS

The underground substations at Crucible are so constructed that the conversion units are virtually isolated from all combustible materials and from interfering with general mine ventilation.

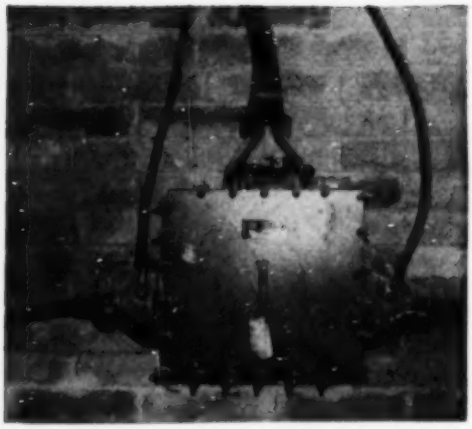
As shown in the illustrations, each station is a tight cell constructed of concrete-block walls and end panels with concrete floor and steel-end-concrete roof. Sections of rubber belt are laid on the floor to provide an insulating carpet for the men who check the operation of the units. The incoming 2,300-v AC line is carried on insulators to a locked closet at the side of the substation where the phase fuses are installed. The AC line is brought out of the closet under the concrete floor and out of the floor near its point of connection to the transformers on the AC car. Expanded-metal gates at both ends of each substation are locked at all times to unauthorized persons. In addition, normally-open fire doors are provided for emergencies that might arise.



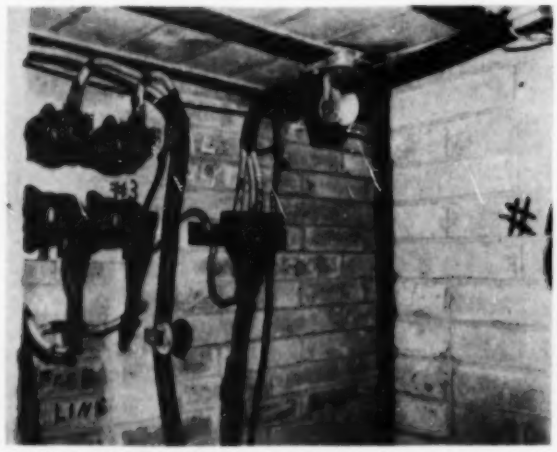
WELL-PLANNED power distribution promotes high efficiency at Crucible.

Normal ventilation courses through the expanded-metal doors, but if a fire should occur it becomes necessary to close the fire doors (an automatic operation) to eliminate any possibility of smoke or fumes entering the main airways.

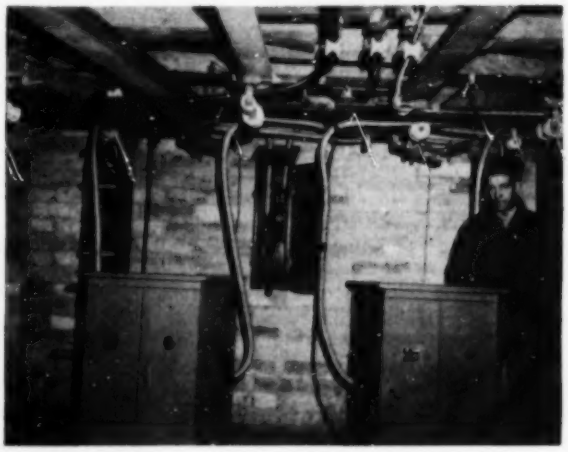
The steel fire doors are held open by safety latches which are supported by a system of overhead twine connectors running through the substation over the conversion unit. If trouble should come, the heat will burn through the twine, permitting the latches to release the fire doors. The doors are roller-mounted on a sloping rail, and as the latches drop away the



JUNCTIONS IN 2,300 V AC CABLE are protected in locked concrete-block cells along haulageway. Cable is installed in 1,000-ft lengths, and only approved junction boxes are used at connection points.



POWER BOREHOLES are equipped with disconnect and interchange switches at the bottom and oil circuit breakers at the surface.



SECTIONALIZING CIRCUIT BREAKERS contribute to safer, more efficient mining by heading off possible electrical troubles such as short circuits or overloads.

doors roll across the openings at both ends of the station to seal it from the main air current. Thereafter, smoke and fumes are directly conducted to the main return through 6-in pipes. At all times, each substation is partially ventilated by a separate split of air through the same 6-in pipes.

INSTALLING POWER LINES

Adequate power for the mining units and haulage locomotives is provided in a DC network that includes the trolley wire, 1,000-MCM feeder and bonded and cross-bonded rails. Mr. Latta points out that because of the great extent of the workings, high efficiency can be maintained only if both sides of the circuit are balanced and if the circuit resistance is kept as low as possible through good bonding.

The AC power from the power boreholes is conducted through buried cables, armored either with lead covering or neoprene-jacketing. The cables are laid in a trench which is cut into the bottom to remove them from any possible contact with the coal, after which the trench is filled with incombustible clay to provide an added margin of safety.

The transmission cable is installed in approximately 1,000-ft lengths. Connections between the lengths of transmission cable are made in locked concrete-block cells set into the ribs along the main haulageway. These junction boxes are blade-type for localizing shorts or grounds and are furnished by G&W Electric Specialty Co., and all elements in the system are adequately grounded.

At places where the AC cable crosses haulageways, such as the entrances to substations, it is buried beneath the track sufficiently deep to prevent damage from the rolling stock. Naturally, there is a disconnect switch at the foot of each borehole in accordance with accepted good practice, and adjacent boreholes are interconnected to help solve the problems that might arise from outages at surface substations or in the boreholes.

SECTIONALIZING THE SYSTEM

I-T-E Type KSC automatic-reclosing circuit breakers, set to operate at 1,200 amp, are used throughout the system. However, at stub ends where the only loads are those connected with pumping the circuit breakers are equipped with auxiliary relays which open the devices at loads of 400 amp.

The DC lines leaving the substations are protected by similar circuit breakers with trip-free operating mechanisms. Main branch lines to the producing sections are likewise protected to isolate outages to a single affected section, and an added measure of protection is provided in disconnect switches at 1,500-ft. intervals.

How Does Your Property Rank Among . . .

The 50 Biggest Mines in 1952

THE IMPORTANCE of mechanized mining and mechanical cleaning is aptly illustrated in this list of the 50 top 1952 producers prepared by J. R. Forsythe, general manager, *Keystone Coal Buyers' Manual*, a *Coal Age* affiliate. Collectively, these 50 mines dropped off about 3% in tonnage from 1951 to 1952, considerably better than the industry as a whole, which was down an estimated 12.4% in 1952.

All but four of the 50 mines are equipped with cleaning plants, and three of those four are captive operations in the Far West. Of these 50 mines, 15 are new within the last 7 yr, 15 are captive mines, nine are strip operations and four obtain part of their output from stripping. Approximately 20% of the total coal production expected in 1953 will come from new mines opened in the past 5 yr.

	COMPANY	NAME OF MINE	STATE	PRODUCTION 1952	1951	1945
1.	U. S. Steel Corp.	*Robena (c)	Pa.	3,332,872	4,084,631	1,557,778[1]
2.	Hanna Coal Co., Div. Pitts. Consol.	Georgetown (s)	Ohio	2,539,835	2,085,572	1,942,055
3.	Eastern Gas & Fuel Assoc.	Federal No. 1	W. Va.	2,227,377	2,047,672	1,692,509
4.	Clinchfield Coal Corp.	*Moss (ps)	Va.	2,187,942	1,830,578	New 1947
5.	Peabody Coal Co.	*Peabody No. 17	Ill.	1,897,168	1,824,575	New 1949
6.	Eastern Gas & Fuel Assoc.	Kopperston 1 & 2	W. Va.	1,888,068	1,876,447	1,173,915
7.	Homestead Coal Co.	*Homestead (s)	Ky. W.	1,795,487	1,661,238	456,337[2]
8.	Jones & Laughlin Steel Corp.	Vesta No. 5 (c)	Pa.	1,790,388	2,258,899	1,243,827
9.	Peabody Coal Co.	No. 8	Ill.	1,713,848	2,538,457	1,916,322
10.	Jones & Laughlin Steel Corp.	Vesta No. 4 (c)	Pa.	1,570,907	1,913,121	1,423,574
11.	Powhatan Mining Co.	No. 1 & 2	Ohio	1,566,789	1,210,350	847,934
12.	Mathies Coal Co.	*Mathies (c)	Pa.	1,474,438	1,398,115	59,992[3]
13.	Bethlehem Collieries Corp.	*Idamay No. 44 (c)	W. Va.	1,452,605	1,539,334	New 1946
14.	Northwestern Improvement Co.	Rosebud (c) (s)	Mont.	1,406,321	1,488,300	2,555,207
15.	Guyan Eagle Coal Co.	Guyan 1, 3 & 4	W. Va.	1,363,077	1,277,711	838,055
16.	Consolidation Coal Co. (W. Va.), Div. Pitts. Consol.	No. 32	W. Va	1,360,635	1,421,471	1,191,348
17.	Lehigh Navigation Coal Co.	Tamaqua (a) (ps)	Pa.	1,358,224	1,210,404	1,003,606
18.	Semet Solvay Div.	Harewood (c)	W. Va.	1,357,193	1,866,522	1,329,208[4]
19.	Columbia-Geneva Steel Div., U. S. Steel Corp.	Horse Canyon (c)	Utah	1,296,443	1,140,837	1,125,148
20.	West Kentucky Coal Co.	*Pleasant View	Ky. W.	1,295,320	1,218,686	New 1949
21.	Old Ben Coal Corp.	*No. 9	Ill.	1,285,631	1,308,562	162,006[5]
22.	Hanna Coal Co., Div. Pitts. Consol.	Bradford (s)	Ohio	1,281,079	1,218,009	343,801[6]
23.	United Electric Coal Cos.	Fidelity No. 11 (s)	Ill.	1,261,733	1,601,693	1,545,552
24.	Chicago, Wilmington & Franklin Coal Co.	*Orient No. 2	Ill.	1,253,526	667,169	New 1950
25.	Enoco Collieries, Inc.	Enoco	Ind.	1,242,664	1,257,853	915,223[7]
26.	Bethlehem Collieries Corp.	No. 41 (c)	W. Va.	1,236,354	1,326,312	1,802,699
27.	Powhatan Mining Co.	No. 3	Ohio	1,220,971	1,358,440	942,142[8]
28.	Tennessee Coal & Iron Div., U. S. Steel Corp.	*Concord (c)	Ala.	1,217,692	1,284,126	New 1947
29.	Miners Coal Co.	*Fies	Ky. W.	1,210,938	1,225,476	New 1949
30.	Rochester & Pittsburgh Coal Co.	Ernest	Pa.	1,203,745	1,216,103	1,200,003
31.	Christopher Coal Co., Div. Pitts. Consol.	Pursglove No. 15	W. Va.	1,197,000	967,228	465,770
32.	U. S. Steel Corp.	Gary No. 2 (c)	W. Va.	1,190,616	1,533,197	1,711,444
33.	Truax-Traer Coal Co.	Red Ember (s)	Ill.	1,178,244	1,194,321	1,349,521
34.	Christopher Coal Co., Div. Pitts. Consol.	Osage No. 3	W. Va.	1,177,260	1,109,013	996,949
35.	Inland Steel Co.	*Price (c)	Ky.	1,165,703	1,367,438	1,430,000[9]
36.	West Kentucky Coal Co.	*East Diamond	Ky. W.	1,164,738	1,184,622	New 1945
37.	Truax-Traer Coal Co.	Pyramid (s)	Ill.	1,144,906	853,655	1,280,206[10]
38.	Christopher Coal Co., Div. Pitts. Consol.	Arkwright No. 1	W. Va.	1,142,690	1,112,698	547,550[11]
39.	Enos Coal Mining Co.	Enos (s)	Ind.	1,137,501	1,305,313	1,314,831
40.	Freeman Coal Mining Corp.	*Freeman No. 3	Ill.	1,130,344	1,088,664	New 1947
41.	Republic Steel Corp.	Clyde (c)	Pa.	1,120,770	1,425,633	1,050,581
42.	Powellton Coal Co.	Jane Ann	W. Va.	1,117,714	1,147,183	610,000
43.	Pocahontas Fuel Co., Inc.	Poca. 33 & 34	Va.	1,115,125	1,305,056	1,243,800
44.	Ebensburg Coal Co.	No. 1	Pa.	1,107,348	1,198,704	1,167,343
45.	Sunnyhill Coal Co.	*Sunnyhill (s)	Ohio	1,089,103	1,046,834	New 1947
46.	Truax-Traer Coal Co.	Burning Star (ps)	Ill.	1,087,646	1,518,143	1,332,965
47.	Chicago, Wilmington & Franklin Coal Co.	Orient No. 1	Ill.	1,074,715	1,026,226	1,651,582
48.	Union Pacific Coal Co.	Superior D. O. Clark (c)	Wyo.	1,056,588	985,485	1,602,771
49.	Lehigh Navigation Coal Co.	Coaldale (a) (ps)	Pa.	1,053,967	937,877	1,539,439
50.	Crucible Steel Co. of America	Crucible (c)	Pa.	1,046,846	1,238,005	1,103,011
	TOTAL OUTPUT, 50 Mines			69,799,820	71,901,958	47,666,004
	U. S. TOTAL, Anthracite, Bituminous and Lignite			504,974,000	575,644,000	631,164,695

SYMBOLS: (a) Anthracite mines. (c) Captive mines. (s) Strip mines. (ps) Part of output from stripping. * New mines since 1945. [1] Ronco-Robena mine, Robena under development. [2] Deep mine, now exhausted. [3] Pittsburgh Coal Co. [4] 1944 tonnage, 1945 unavailable. [5] Mine under development, opened in 1945. [6] Bradford Collieries Corp. [7] Knox Consolidated Coal Corp. [8] Rail & River Coal Co. [9] Wheelwright mine, now part of Price. [10] Pyramid Coal Corp. [11] Consolidation Coal Co.

Old Problem . . .

Preliminary tests show low-cost hand-hydraulic timber setter cuts manpower, increases output. Newly developed unit easily mounted on timber car.

By W. E. CONNOR
Mechanical Superintendent
And A. G. FRANK
Assistant Mechanical Superintendent
Lehigh Navigation Coal Co.
Lansford, Pa.

1 FIRST STEP in cycle is to pick up timber from bottom or tender car with a sling or grab attached to swivel hook on the hydraulic lifting mechanism. Unit also can be used to pull legs, re-rail cars or lift heavy machinery.

2 THE LIFTER revolves 360 deg to place collar in positioning standards at sides. Swivel hook permits handling long timbers in confined areas.

3 WITH COLLAR resting on standards, sling is detached and lift is swung down and back under timber.

LAST DECEMBER we invited the regional representative of an Ohio manufacturer specializing in hand-power hydraulics to visit us at Lansford. We were seeking an answer to an old problem, "How can we convert every timbering crew to a mechanized unit . . . economically?"

We told the manufacturer's man that for safety and economy we wanted to eliminate electric or air-driven equipment, with all their required special motors and sparkproof controls, and that our pursuit for an answer led to the field of hand-powered hydraulics. Our job required a unit designed to meet our deep-mine conditions, low enough for safe clearance, yet with lift enough to raise timbers well over the usual 8-ft tunnel height —a unit that could be mounted on any mine truck and, if possible, easily removed—and providing a lifting capacity of 1 ton together with the sturdiness of construction to handle timbers up to 20 ft long.

The manufacturer's representative, O. S. "Bud" Parker, of Kingston, Pa., was quite confident that his company, Ruger Equipment, Inc., of Uhrichsville, Ohio, could do the job. He arranged a meeting, which took place in our offices the following week, attended by Mr. Parker, two men from the Ruger factory and our staff. The result of the meeting was delivered to our forge shop 3 wk later. It weighed 300 lb and already bore the registered name "Timberlift."

. . . New Approach

The mounting socket, or well, which holds the lift was installed near the end of a flat-bed timber car. This socket was the only installation requiring shop work. The Timberlift was a simple bolt-and-nut assembly of mast, cantilever boom, timber-holding cradle and cradle stabilizer.

The Timberlift was then scheduled for mine duty under the supervision of William Charles, assistant mine superintendent, and the observation of P. L. Burkhart, test engineer, in No. 9 shaft, where the first anthracite mining operations began in 1792.

For the purposes of our study to evaluate the practicality of the unit and to make an accurate determination of labor savings and increased production, we asked for periodic time studies, operational and mechanical reports, and working photographs, such as the accompanying.

The following are excerpts from Test Engineer Burkhart's reports:

"**Jan. 30, 1953**—The hoist worked very well, and undoubtedly saves considerable time and manpower, and makes older men available for timbering who are not capable of lifting collars by hand . . ."

"**Feb. 23, 1953**—This machine proved its worth with the hoisting of these four collars . . . whereas with hand hoisting, there would be two to three times as many men required and for a longer period of time . . ."

"**Feb. 23, 1953**—In my report of Jan. 30th which covered the hoisting of seven collars, no mention was made of the distance of movement between placements, which was as follows: Between first and second collars, 275 ft; between second and third collars, 4,675 ft; between third and fourth collars, 350 ft; between fourth and fifth collars, 1,900 ft; between fifth and sixth collars, 40 ft; and between sixth and seventh collars, 25 ft; or a total distance between the first and seventh collars of 7,265 ft . . ."

It seemed at this point that our problem was solved, but there was still one incalculable factor. It wasn't necessary to go far to get an answer. We asked Assistant Mine Superintendent Bill Charles, under whose supervision the equipment was tested, the all-important question:

"How do the men doing the job like the Timberlift?" Charles replied, "I'd hate like the devil to try to take it away from them!"

That is all we needed to know to proceed with our operational changes and start training Timberlift crews.

4 **AS BOOM IS RAISED,** swivel cradle lifts collar from positioning brackets into position in tunnel roof. Timber shown here is 11 ft 2 in long, 20 in in diameter and weighs 1,400 lb.

5 **WITH TIMBER** in place, swivel cradle now may be removed. Hydraulic lifter is powered by double-action hand pump requiring only 20 to 40 lb of effort and equipped with an automatic overload relief valve. Entire unit is easily mounted on flat-bed timber car.

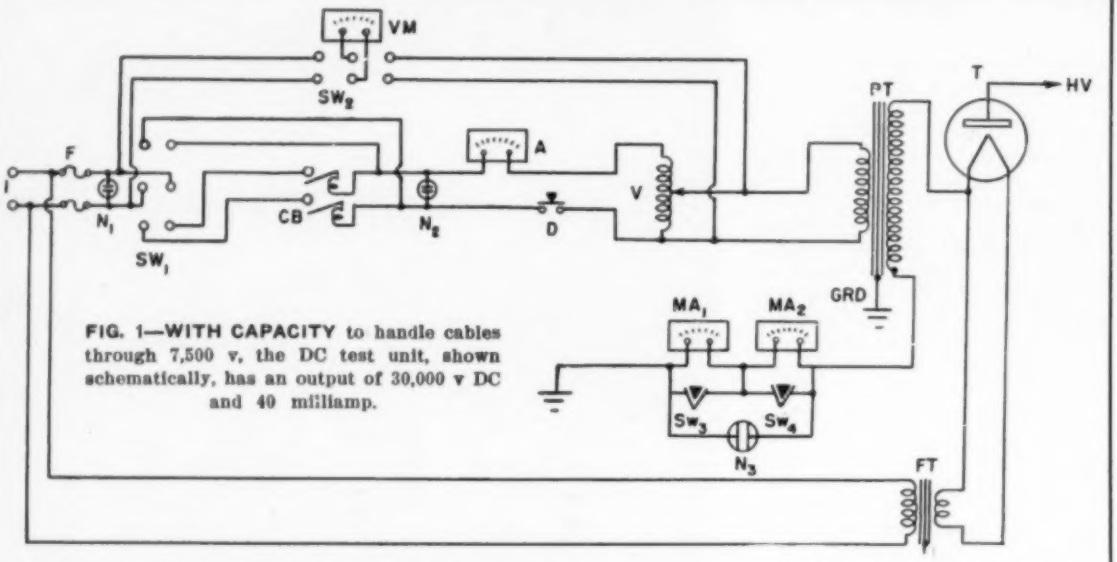


FIG. 1—WITH CAPACITY to handle cables through 7,500 v, the DC test unit, shown schematically, has an output of 30,000 v DC and 40 milliamp.

I—Input, 115 v, 50/60 cycles, 15 amp.
F—Fuses, 12-amp.
N 1—Neon indicating light (clear).
SW 1—Double-pole double-throw switch.
CB—Circuit breaker, 5-amp, time delay.
SW 2—Double-pole double-throw switch.
Vm—AC voltmeter, 0-150 v.
N 2—Neon indicating light (amber).
A—AC ammeter, 0-10 amp.
D—Deadman switch.
V—Variac V 10 (10 amp).
PT—Plate transformer, 115/20,000 v, 40-milliamp output.
FT—Filament transformer, 115/5 v, 10.5 amp, insulated for 40,000 v DC.
T—Half-wave rectifier tube, 60,000-v inverse peak, 250-milliamp output for 5-v filament.
MA 1—DC milliammeter, 0-1 milliamp.
MA 2—DC milliammeter, 0-50 milliamp.
SW 3—Meter switch, push to open.
SW 4—Meter switch, push to open.
N 3—Neon indicating light (red).
Grd—Ground.
HV—High-voltage DC output to cable under test (or fault-locating equipment).

How to Use High-Voltage DC for . . .

Cable Testing • Fault Location

How the equipment is built . . . How cables are tested . . . How faults are located

By ROY A. NELSON, Test Engineer
Simplex Wire & Cable Co., Chicago

HIGH-VOLTAGE DC can be used advantageously to check the electrical condition of the insulation and locate faults in all types of mining cables. DC has the ability to search out weaknesses in the cable insulation, and yet not destroy faults that may be present. By periodic, systematic DC testing, the relative health of the electrical system can be determined and signs of weakness can be picked up before a serious and costly outage occurs. Furthermore, with the same equipment—with slight modifications—faults can be located without damaging the faults beyond repair.

(Continued on p 110.)

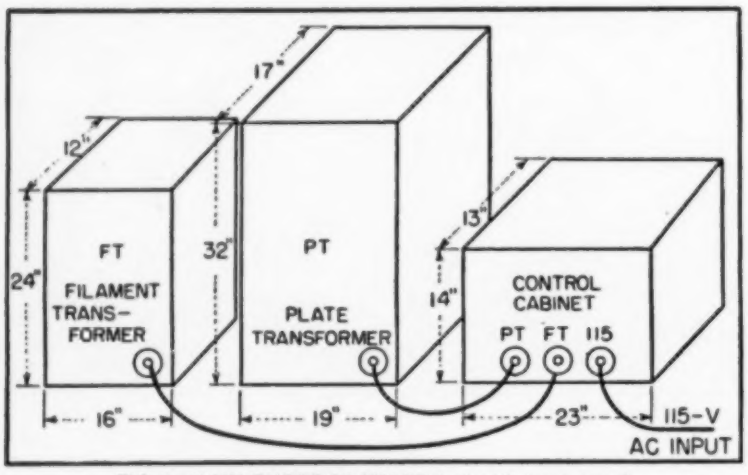


FIG. 2—HOW THREE-PACKAGE test unit is arranged.

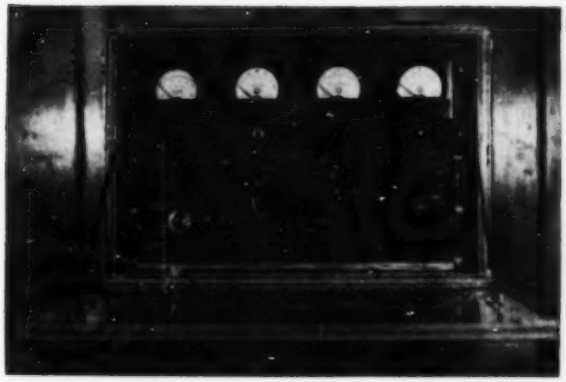


FIG. 3—FRONT VIEW desk-type control cabinet. Unit is enclosed in 14x23x13 box of ¾-in plywood; weight, 50 lb. Test and fault-locating operations are controlled from this panel. Front opens up as desk for recording readings.

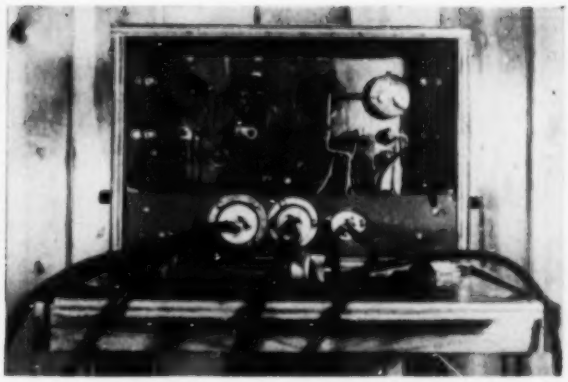


FIG. 4—REAR VIEW of control panel showing three cords with polarized plugs leaving cabinet for plate transformer, filament transformer, and 115-v AC input. Handles are attached to the sides of the cabinet for ease in handling.

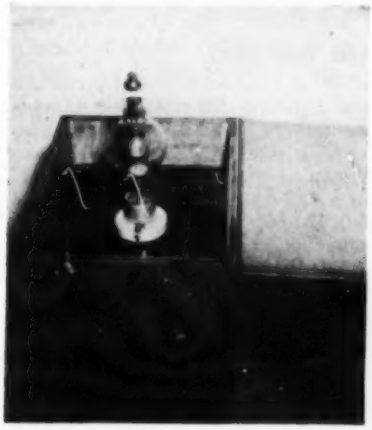


FIG. 5—HIGH-VACUUM rectifier tube mounted in porcelain socket on bakelite top; 5-v filament-transformer secondary connects to tube socket through ½-in bakelite panel. Tube is removed and cover locked for moving.

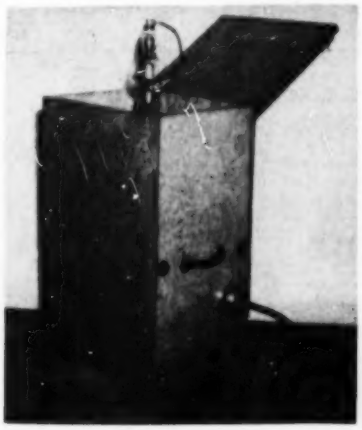


FIG. 6—FILAMENT TRANSFORMER in 16x12x24-in box of ¾-in plywood; weight, 90 lb. Three conductor cord with polarized plug connects transformer to control cabinet. Handles on side permit carrying into mine or pit.

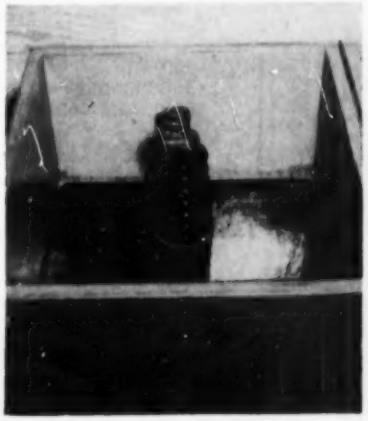


FIG. 7—HIGH-VOLTAGE POTHEAD mounted on bakelite top. High-voltage side of secondary winding from plate transformer inside feeds pothead through ½-in bakelite panel. Cover is locked to protect pothead in moving.

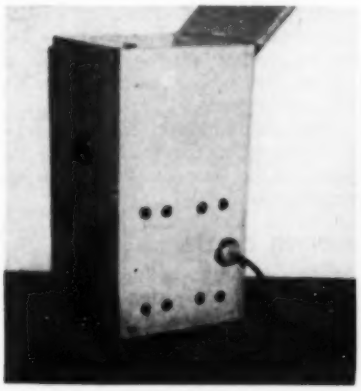


FIG. 8—PLATE TRANSFORMER is enclosed in 17x19x32 box of ¾-in plywood: weight, 150 lb. Four-conductor cord with polarized plug connects transformer to control cabinet.

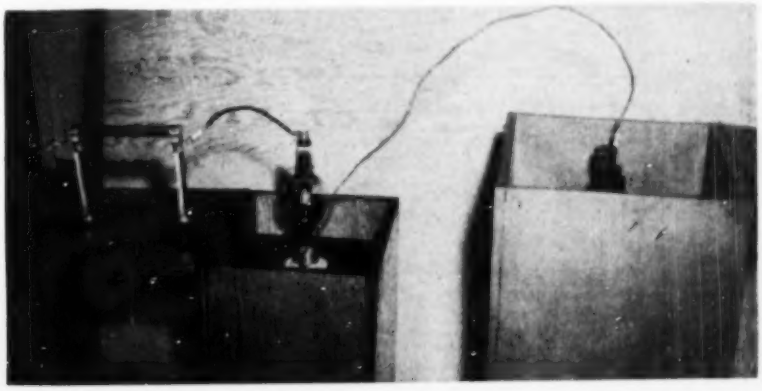


FIG. 9—PLATE TRANSFORMER is here shown connected to the filament transformer. A short lead with a battery clip on each end and suspended in the air connects from the plate transformer to one side of the filament at the base of the socket. High voltage rectified DC is taken from plate or cap of half-wave rectifier tube.

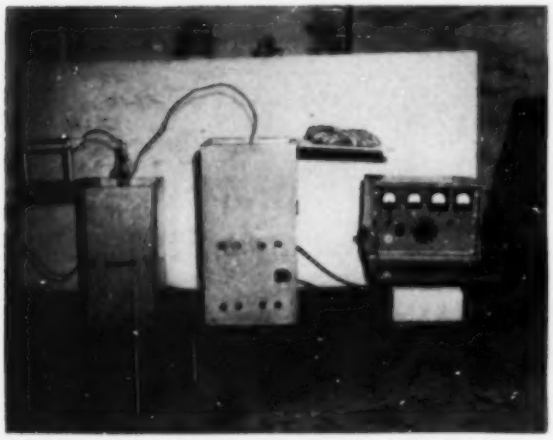


FIG. 10—THE THREE TEST UNITS TOGETHER from the front. A 5,000-ohm resistor on polystyrene standoff insulators is inserted between tube plate and test lead shown on the floor.

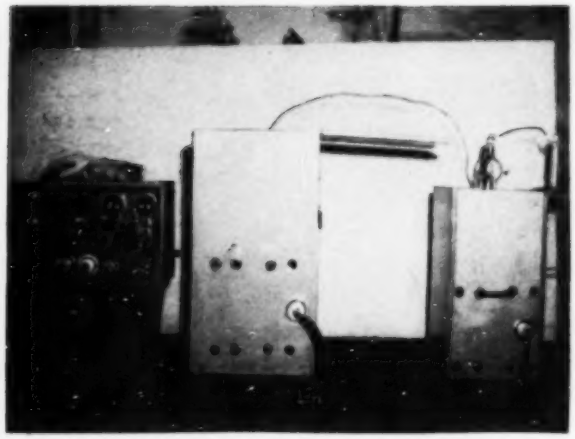


FIG. 11—REAR VIEW shows three units connected by two cords, and one two-conductor cord for 115-v AC input. Control cabinet separated from high-voltage equipment for safety to the operator.

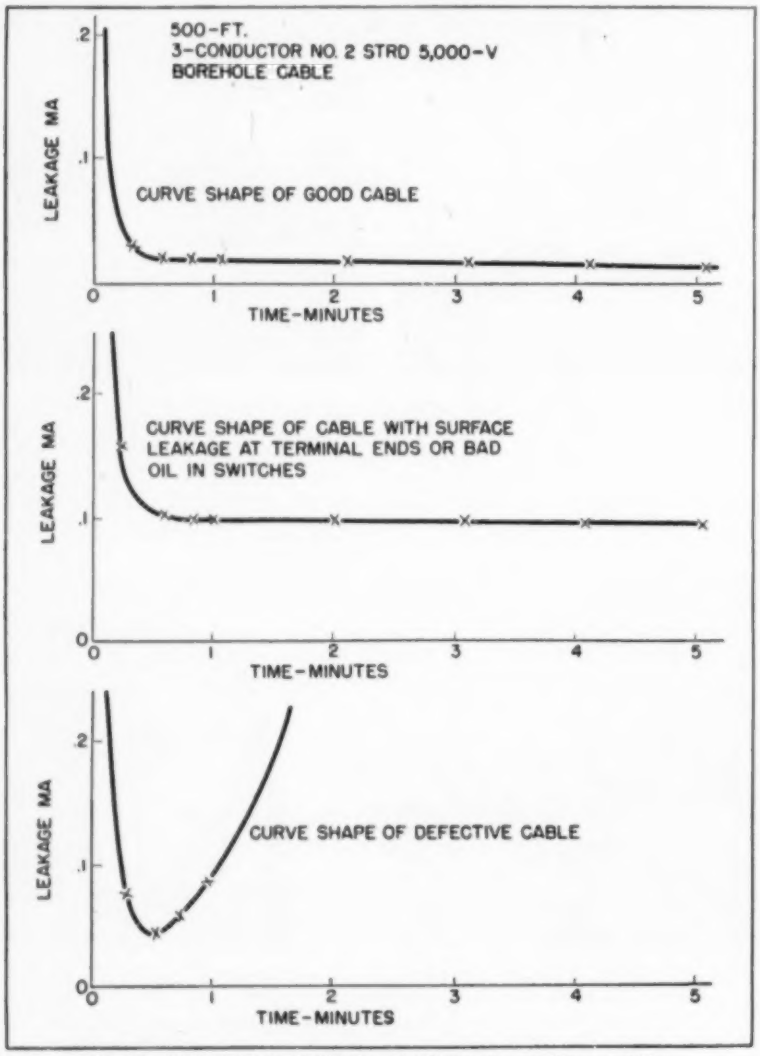


FIG. 12—HOW POLARIZATION CURVES show cable condition.

THE TEST UNIT

DC is used for testing because the test apparatus can be made light, economical, durable and portable, and because it takes very little energy from the line. Fig. 1 is a schematic diagram of a DC test unit with an output of 30,000 v DC—40 milliamp—which is suitable for testing cables through 7,500 v. The complete test unit is made in three packages connected together by multiconductor Tirex cords with polarized plugs on each end, as shown in Fig. 2. Component parts of the test unit are shown in Figs. 3 to 11, inclusive.

The filament transformer (Fig. 6) has an output of 5 v, 10.5 amp, and is insulated for 40,000 v DC. The plate transformer (Fig. 8) is rated at 20,000 v, 40 milliamp. The units connected together ready for testing are shown in Figs. 9 to 11. A Type RG 8/U or 11/U shielded polyethylene coaxial cable makes an excellent test lead. A kilovoltmeter is used to read the DC output voltage of the unit, and to calibrate the AC-input voltmeter for production testing.

With fault locater, discussed later in this article, the total cost of the parts for the complete test unit is approximately $500.

MINING CABLES

The testing and fault-locating equipment previously described is capable of handling all types of mining cables regardless of size, length or location. The equipment is sufficiently portable to permit taking it into a strip pit for checking cables in conjunction with a 1,500-w 115-v AC gasoline-driven generator. Type SH-D cable rated at 5,000 v is commonly used on electric shovels because it pro-

vides the greatest protection to both cable and personnel. An unlocated fault in such a cable can be costly. This fault-locating equipment can find the fault in 5 min after it is set up.

The equipment can be used on the surface to check the insulation of borehole and shaft cables. The two most common types are the steel-armored and rubber-jacketed. Periodic testing will reveal the electrical health of such cables and will prevent costly outages by showing up weak spots before outages occur.

If necessary, of course, the portable testing equipment can be taken underground to test feeder cables. For greater convenience, this testing can be done on off days and any trouble spotted can be eliminated before the next working shift. Systematic testing of course enhances safety. Trailing cables on shuttle cars, locomotives, loaders, cutters and other equipment also may be tested if desired.

TESTING PROCEDURE

The recommended procedure is to apply voltage from the test units slowly to one conductor of the cable, grounding the other phases, shield and ground wire to the equipment and system ground. Because of the relatively low capacity of the DC test unit, it is necessary to keep the initial charging current low.

When the cable being tested is fully charged, the current flow is the true leakage current, which is registered on the milliammeter. The voltage is held for 5 min and the leakage current is read at intervals to provide a polarization curve, as shown in Fig. 12.

The shape of the curve indicates the electrical condition of the cable under test and exposes any potential weakness in the insulation. Furthermore, by periodic DC testing, the relative condition of the insulation of each phase can be determined. When any phase starts to weaken, the fault can be determined, located and repaired. Fig. 13 shows the results of periodic tests on a length of feeder cable, revealing how Phase B started to weaken in a splice after about 2 yr of operation.

It is the combination of applying high voltage and reading the leakage current that gives a true picture of the electrical condition of the cable. Tests may include not only the cable but also splices, terminations, oil switches, current transformers and insulators.

Test voltages for new cables are tabulated in IPCEA specifications for rubber and varnished-cambric insulations. However, this test voltage may be varied in accordance with the age

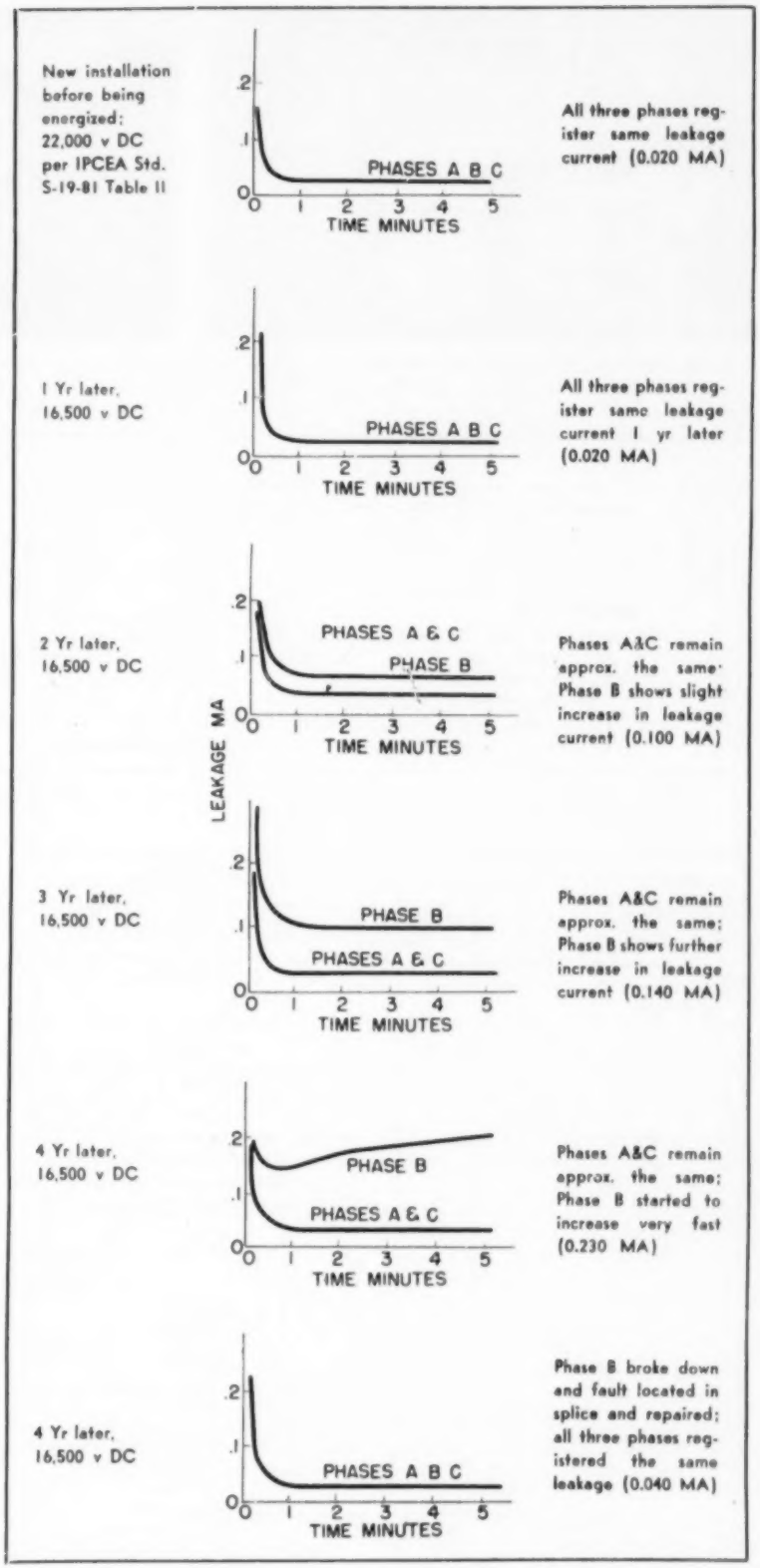
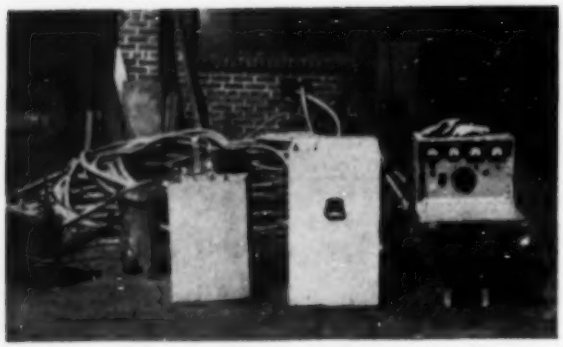

New installation before being energized: 22,000 v DC per IPCEA Std. S-19-81 Table II
PHASES A B C
All three phases register same leakage current (0.020 MA)
1 Yr later, 16,500 v DC
PHASES A B C
All three phases register same leakage current 1 yr later (0.020 MA)
2 Yr later, 16,500 v DC
PHASES A & C
PHASE B
Phases A&C remain approx. the same. Phase B shows slight increase in leakage current (0.100 MA)
3 Yr later, 16,500 v DC
PHASE B
PHASES A & C
Phases A&C remain approx. the same; Phase B shows further increase in leakage current (0.140 MA)
4 Yr later, 16,500 v DC
PHASE B
PHASES A & C
Phases A&C remain approx. the same; Phase B started to increase very fast (0.230 MA)
4 Yr later, 16,500 v DC
PHASES A B C
Phase B broke down and fault located in splice and repaired; all three phases registered the same leakage (0.040 MA)
LEAKAGE MA
.2
.1
0
0 1 2 3 4 5
TIME MINUTES

FIG. 13—RESULTS of periodic high-voltage DC insulation tests on 1,000 ft of 3-conductor 5-kv No. 6 feeder cable; ambient temperature, 21 C.



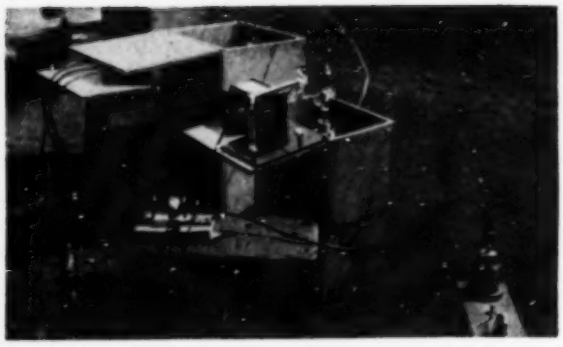


FIG. 14—FAULT-LOCATING EQUIPMENT set up for checking 5-kv shovel cable coiled up outside mine electrical shop. The electrician can locate the fault, repair it, and then test it himself before releasing the cable for service.

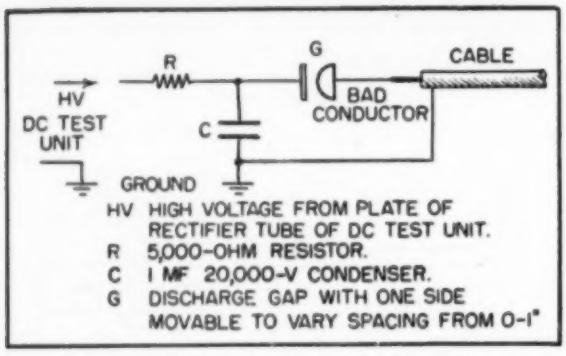


FIG. 15—FAULT-LOCATING EQUIPMENT.

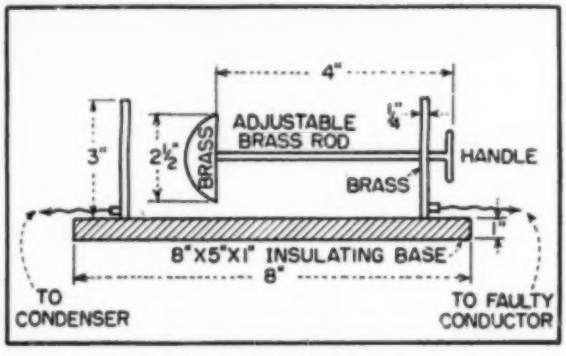


FIG. 16—ADJUSTABLE SPARK GAP dimensions and use.

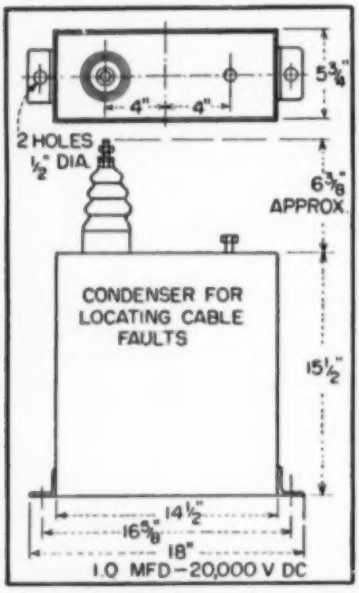


FIG. 17—CONDENSER for locating faults in cables.

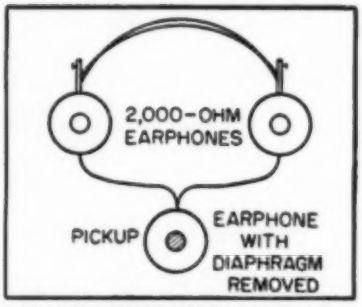


FIG. 18—MAGNETIC fault pickup.

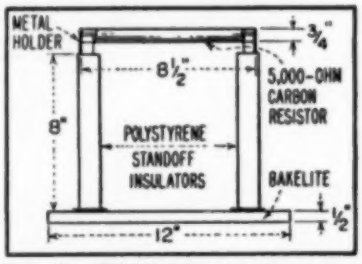


FIG. 19—MOUNTED 5,000-ohm carbon resistor for fault location.

of the cable, clearance on the ends, and apparatus served by the cable, in addition to experience and the rigidity of the requirements for the specific application.

FAULT LOCATION

For locating faults, the test equipment is modified by the addition of a spark gap and condenser, as shown in Fig. 15. Fig. 16 shows the physical size of the spark gap, and Fig. 17 the condenser. If a pickup device is required, a pair of earphones connected to another earphone with the diaphragm removed, as shown in Fig. 18, is very practical. To protect the test unit from high current surges, a 5,000-ohm carbon resistor mounted on stand-off insulators (Fig. 19) is employed.

The principle employed in locating a fault or faults, regardless of the resistance, is picking up the discharges sent forth by the condenser and spark gap. High DC voltage is used to charge the condenser with the ground side connected to the cable ground wires, adjacent conductors and shield. When the condenser is charged to a certain value, it will flash across the sphere gap, which is adjusted accordingly. The other side of the sphere gap is connected to the copper conductor of the faulty phase.

A steep wave-front pulse travels along the copper conductor until it reaches the fault. If the potential of the tracer signal is high enough, or the fault resistance is low enough, the signal will discharge across the fault to ground and return. If the signal does not discharge across the fault, then the cable will remain charged. Where this is the situation, the pulse voltage must be increased by enlarg-

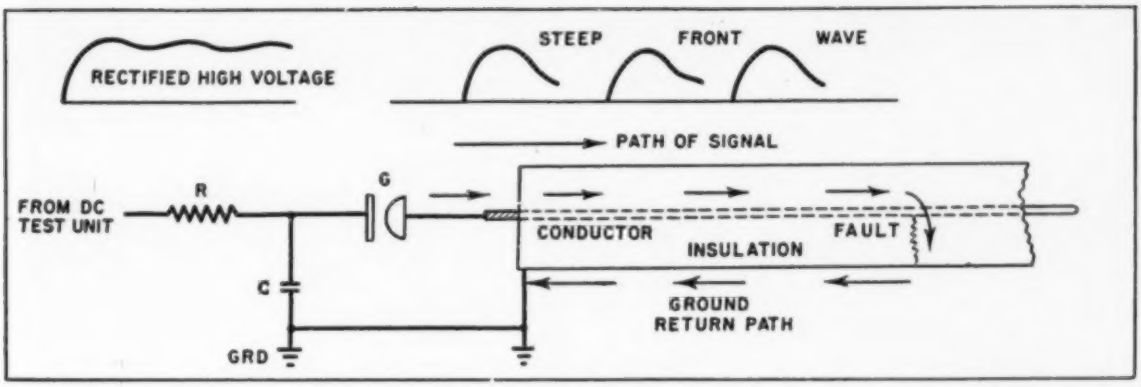


FIG. 20—HOW STEEP WAVE FRONT pulses along conductor to the fault where it flashes to ground and returns to the other side of the condenser. A small portion bypasses and is reflected back from the other end. Return usually is ground wire, metallic covering or conductor of adjacent cable.

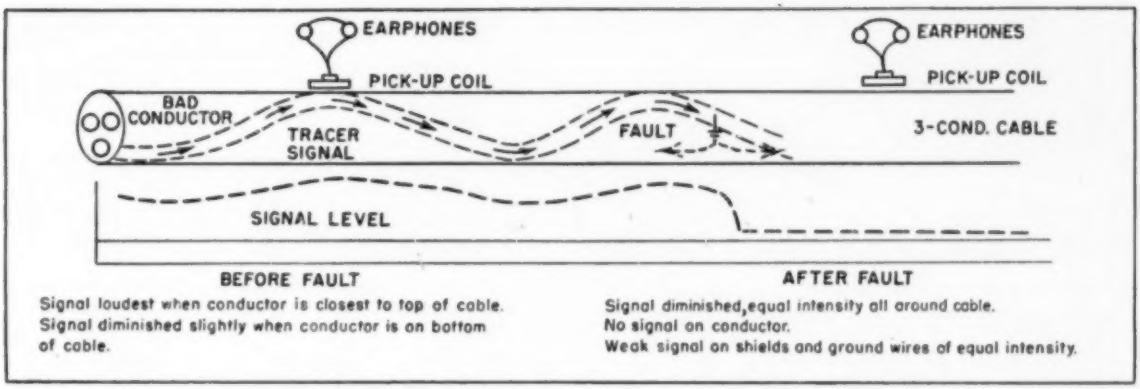


FIG. 21—TRACER-SIGNAL PATTERN in locating a fault. Pickup coil is moved along top surface of cable, starting at generator. Ahead of the fault, the major portion of the signal is in the conductor and a small portion is returning via the shield and ground wires. The pickup-coil signal varies as the conductor spirals and is loudest directly over the bad conductor. The signal drops off abruptly beyond the fault and is equally intense all around the cable.

ing the sphere-gap distance until a value is reached that will cause a flash across the fault.

The maximum voltage applied to the cable is limited by the adjustment of the gap up to 20,000 v DC. The minimum voltage is determined by the resistance of the fault. A small portion of the wave bypasses the fault and is reflected from the far end of the cable. This does not affect the results. Fig. 20 shows how the tracer signal wave travels along a faulted conductor.

LOCATION METHODS

The method of locating the trouble depends upon the nature of the fault. If it is not a dead short or a result of water-soaking, the discharge signal is audible to the human ear. Consequently, the operator has only to walk to the point of discharge to locate the fault. Thus, this type of fault—found mostly in shielded cables—is located easily and quickly.

If the fault has a very low resistance —dead ground or under water—the discharge usually is not audible and a pickup device is necessary. The procedure is to move the pickup coil along the top surface of the cable, starting at the source of supply, and listen for a change in signal, as shown in Fig. 21. This type of fault, though not too frequent, sometimes is very difficult to find. Nonshielded cables, especially with steel armor on the outside, offer the biggest problem in fault-finding. However, the art of locating faults is a product of experience.

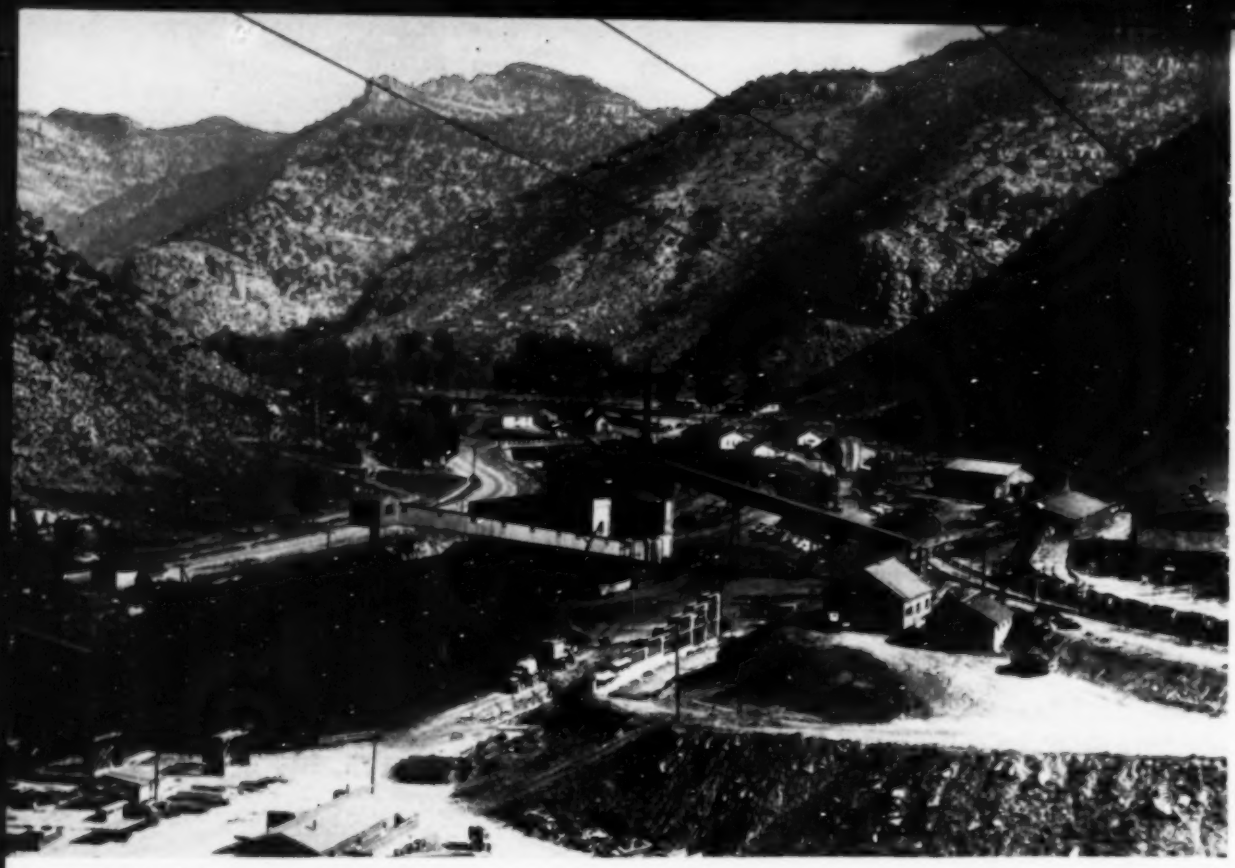
SAFETY IN OPERATION

The correlation between safety and good work is very high. Therefore, the importance of safety cannot be overemphasized in operating this equipment. Rubber gloves must be used at all times, and under no condition should the equipment be used without a standby operator.

All the packages of the test unit must be grounded at all times and checked periodically. The deadman switch is used by the operator at all times when testing is under way. The equipment should be roped off or placed in a safe location so that no others can run into the exposed wires.

Although the shielded coaxial cable offers some protection, caution must be exercised in guarding all exposed ends of the cable under test. Post danger signs in the area where testing is going on. One of the safety features of this equipment is the fact that the control cabinet is a separate unit from the high-potential transformers. Therefore, the operator is removed from the high-voltage source.

Precision testing with DC and fault-locating by the condenser-discharge method have been proved to be entirely practical for checking high-voltage mining cables. Use of these methods can contribute substantially to reducing down time for the equipment served by the cables, thus reducing overall operating costs. Simplicity, portability and safety of operation make such equipment an asset to mining electrical men.



SUNNYSIDE SURFACE PLANT, showing existing washing plant, raw-coal dumping and handling facilities, washed-coal storage and other facilities, including, at the right, a portion of the new motor road serving No. 1 mine.

Rebuilding Sunnyside

For Greater Production With Higher Efficiency

With the accent on more production by raising efficiency, the Sunnyside expansion and rehabilitation program embraces two existing mines and opening of a third to raise coking-coal output from 1,000,000 to 1,715,000 tons per year. Major clean-up and improvement program underground is supplemented by additional preparation and service facilities, including power, water supply and housing.

BY WESLEY HYATT
Project Engineer, Kaiser Engineers, Div. Henry J. Kaiser Co.
And R. G. HEERS
Manager, Sunnyside mines, Kaiser Steel Corp.

TO EXPAND its production of iron, the Kaiser Steel Corp. is currently engaged in adding a third blast furnace and 90 by-product coke ovens at its Fontana (Calif.) steel works. The coal blend that has proven most satisfactory for coke production is 10% low volatile from Arkansas and Oklahoma, and 90% high volatile from company-owned mines at Sunnyside, Utah.

Steel-production expansion necessitated expansion in coal production. Even before that, however, a large-scale rehabilitation program had been initiated, to which the expansion program naturally is closely related.

Adapted from a paper presented at the 1953 annual meeting, American Institute of Mining and Metallurgical Engineers.

THE SUNNYSIDE PROPERTY

There are two coal seams at Sunnyside. The upper ranges from 3 to 6 ft in thickness; the lower from 5 to 14 ft. They are separated by a shale and bony split varying from 6 in to 40 ft thick. The seams pitch down at grades of 7 to 22%, with an average of 10%, from their outcrop near the base of a range of mountains known as the Book Cliffs.

The Sunnyside property extends 6½ mi along the Book Cliffs escarpment and, under present plans, is divided into three mines—Nos. 1, 2 and 3. No. 1 at the north end and No. 2

at the south are working. No. 3, in the center, is being re-opened.

Each mine has approximately 2 mi of outcrop and is developed by a set of slope entries near the center. Track haulage is used from the shuttle-car loaderheads to the preparation plant, located near the outcrop near No. 3 portal. The coal is hoisted up the main slopes and, in the case of Nos. 1 and 2 mines, is moved by mainline locomotives from the heads of the slopes about 2 mi to the surface.

PRODUCTION MECHANIZED

Working sections at Sunnyside are turned right and left off the main slopes at intervals of approximately 300 ft. Each mining section is equipped with a crawler-mounted loading machine, an 8-ton 4-wheel-drive shuttle car, a rubber-tired universal-type cutting machine with a hydraulically powered drill on top, and 12 to 24 mine cars, depending on production and length of haul.

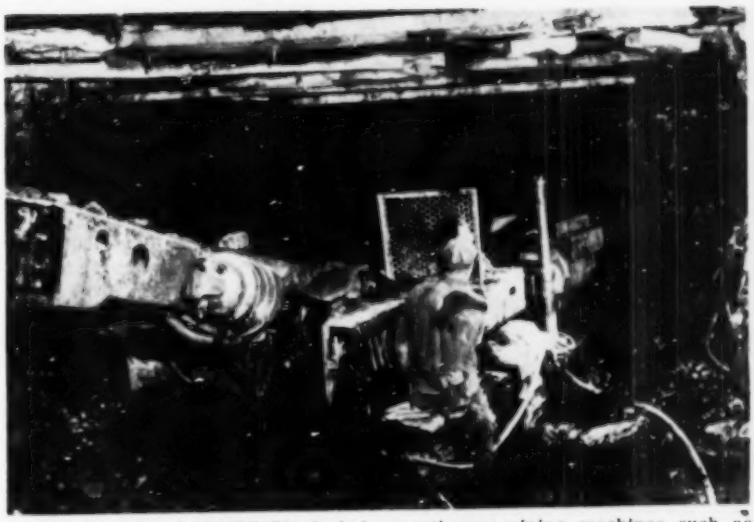
Nine of the sections where the roof is particularly bad will be equipped with mobile roof-bolting machines, each mounting a compressor, two booms and percussion-type drills. Top conditions in No. 2 mine are very bad, and six bolting machines are now used in No. 2 sections.

Three roof-bolting machines are being added as part of the expansion, and will be used between Nos. 2 and 3 mines. Loading, cutting, drilling and bolting machines are powered by 220-v AC derived from power-center units comprising a 200-kva dry-type transformer, an incoming high-voltage oil circuit breaker, and five air circuit breakers on the secondary side serving the various machines.

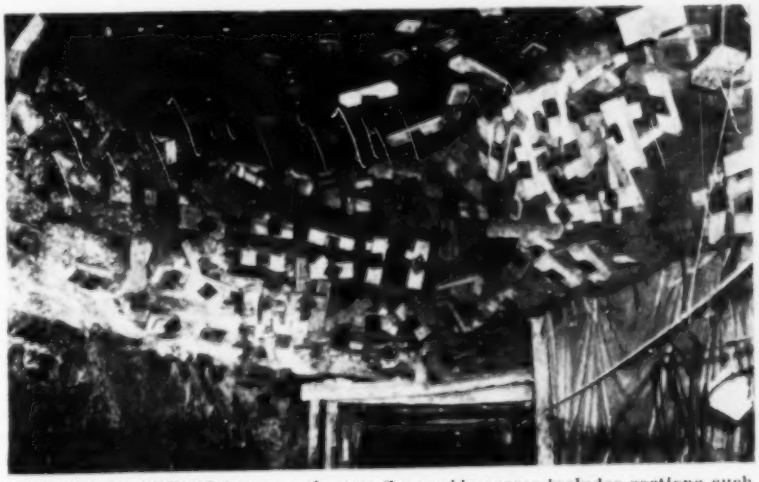
Other miscellaneous equipment in the working sections includes an m-g set to supply 250-v DC power to the shuttle car, a tire pump, AC and DC power circuit breakers at the mouth of the entry, and dewatering pumps when necessary. Two continuous miners are currently in use and two more are being purchased as part of the expansion program. The continuous miners will replace the cutting and drilling machines in the sections where they are used.

SUNNYSIDE HISTORY

The Sunnyside property was opened in 1896 by the Utah Fuel Co. The coal was coked at Sunnyside in beehive ovens and the operation served primarily the smelter industry. Sunnyside prospered and expanded until there was a total of 810 ovens in operation by 1918. A decline started in 1924 and Sunnyside nearly became a ghost town in the 30s.



MECHANIZED PRODUCTION includes continuous-mining machines such as this unit driving entry in No. 1 mine.



VARIABLE PARTING between the two Sunnyside seams includes sections such as this where the interval is 6 ft of sandstone and shale.

REHABILITATION RESULTS—new motor road underground in No. 1 mine, showing 80-lb track with welded joints and bolted roof.

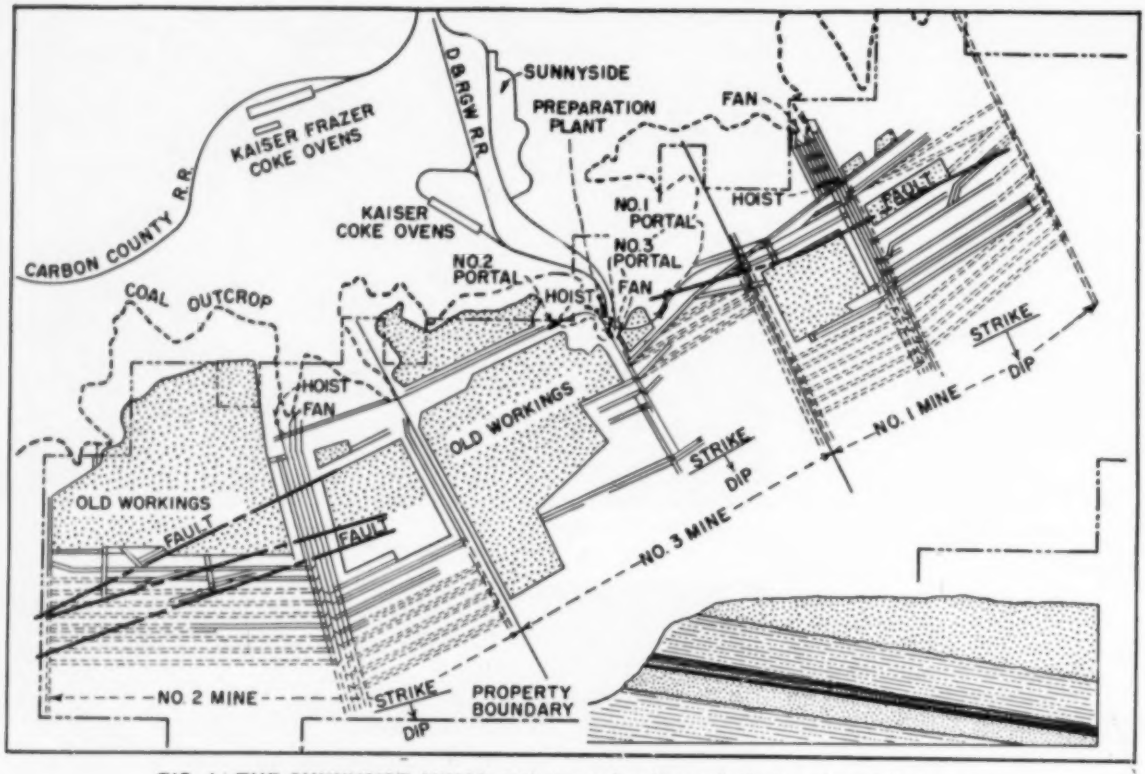


FIG. 1—THE SUNNYSIDE MINES, with inset showing geological section of the seams.

In 1942, Kaiser, in need of coking coal for the new steel plant at Fontana, entered into an agreement with the Utah Fuel Co. to lease No. 2 mine, which had been shut down 18 yr. Kaiser operated No. 2 as lessee from November, 1942, to May, 1950. In May, 1950, Kaiser acquired all the Utah Fuel interests at Sunnyside, including No. 1 mine, the 297 beehive ovens still operating, a town of 450 houses and stores, a water system, and extensive coal reserves.

Throughout the first 50 yr, the operation and maintenance of the Sunnyside property had been subject to the economic fluctuations resulting from two world wars and the big depression of the 30s. Most of the mine and plant was aged and in a poor state of repair.

Some areas of the property had been completely worked out—others partially. And in some parts only development entries had been driven and then abandoned. The upper seam had been mined in approximately one-third of the country opened up. The remainder of the work had been done in the lower seam. There were many miles of caved aircourses and haulage entries in the old workings and in the active No. 1 mine. Having acquired the property, it became Kaiser's job to make the most of it.

Sunnyside Rehabilitation

Shortly after acquisition of the property, plans were made for its improvement. There were certain facilities for which there was an urgent need regardless of whether or not production was to be expanded. These facilities would be doubly necessary in the event production was to be increased and the time involved in their construction should become a factor in the decision to proceed at an early date.

VENTILATION

The fact that all three mines are gassy caused first attention to be given to ventilation improvement. No. 1 mine produces 600,000 cu ft of methane per day, and in one of the development projects it is necessary to have 25,000 cfm passing the last open crosscut to be assured of less than 1% methane in the return.

No. 1 is ventilated by a 7-ft propeller-type fan. When Kaiser took over, the aircourses were so restricted that the fan produced only 150,000 cfm at a water gage of 5.6 in. This was insufficient to prevent delays at the face and to meet the standards of safety desired by the company.

After a thorough study of the problem, 400,000 cfm at a 4-in water gage was established as the ventilation goal. To achieve this, it was decided to:

1. Clean up all existing aircourses, caved or otherwise, and improve roof support with roof bolts and additional timber.

2. Supplement existing aircourses with new ones.

3. Order a second fan to raise circulating volume to 400,000 cfm and step up efficiency. Continuity of operation will be assured by a standby diesel-engine drive.

Ventilation improvement was the largest single undertaking. At this writing, approximately 7½ mi of aircourses in Nos. 1 and 2 mines have been enlarged, cleaned and bolted, and 5 mi of new bolted aircourses have been driven. Several more miles of old and new aircourses are still to be completed.

To illustrate the magnitude of the job, approximately two-thirds of the effort in No. 1 mine has been expended in this direction in the past year. No. 1 mine normally works six sections, but over the past 12 mo rebuilding of old aircourses or the driving of new ones has been the main order of business in four.

Although aircourses normally are not particularly difficult to drive, such was not the case in No. 1 mine. The

barrier pillars along the slope where the aircourses were to be driven were none too large to begin with. Most of the area was under squeeze and the rock was badly broken. After it was determined that the roof could not be held by normal timbering, roof-bolting was adopted as the standard for all aircourses—both new and rebuilt.

Particularly severe difficulties were encountered in providing adequate cross-sectional area in the lower half of No. 1 slope, where the coal is 13 ft high. When Kaiser acquired the mine, there were four slope entries driven on 60-ft centers. A number of caves had occurred, totalling 3,000 ft of slope entry and often going 8 to 10 ft into the roof rock before choking.

Experience soon demonstrated that it was impractical to support the resultant enlarged entry 20 to 25 ft high. After several such attempts, it was decided that this method of restoring the aircourses was not possible because of the weight of the overburden, the inadequacy of the pillars, the height of the openings, the general squeeze in the area.

A new system was adopted in which enough of the loose caved rock is cleaned to provide a clearance of 10 to 12 ft over the top of the cave, leaving the remainder of the rock on the floor to support the thin pillars and the loose ribs. This puts the entry through the caved section in the rock strata above the coal. The entries thus cleaned have an arched section with roof and ribs bolted, making them much easier to maintain. Resultant irregularities in the aircourse profile are less restrictive to air flow than the changes in cross-sectional area that would have resulted if the caves had been entirely loaded out.

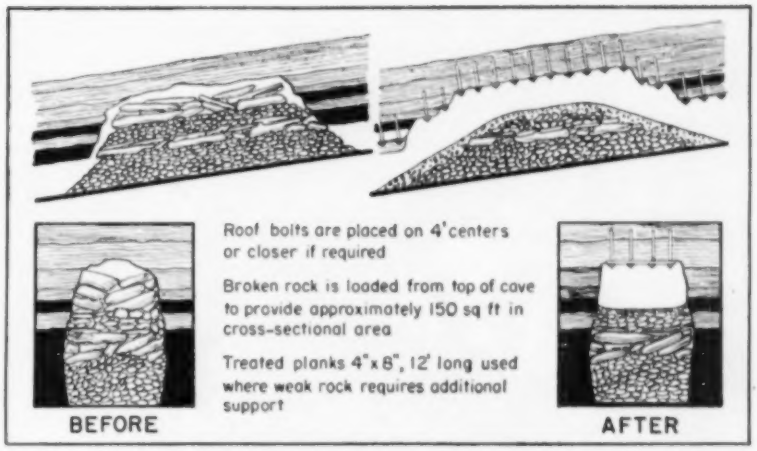

Roof bolts are placed on 4' centers or closer if required
Broken rock is loaded from top of cave to provide approximately 150 sq ft in cross-sectional area
Treated planks 4"x8", 12' long used where weak rock requires additional support
BEFORE
AFTER

FIG. 2—AIRCOURSE BEFORE AND AFTER, showing original condition in many areas and how rebuilding was done.

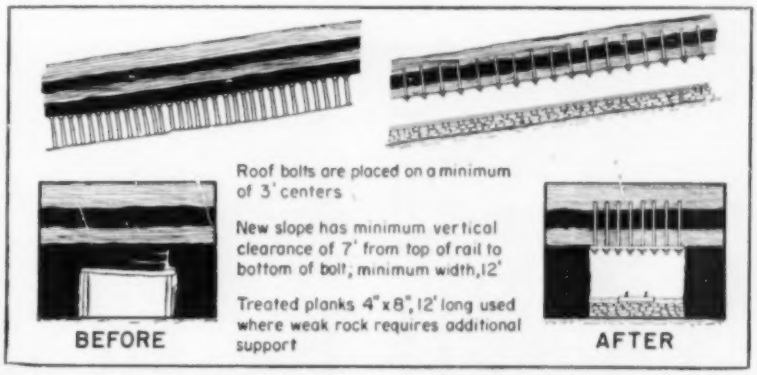

Roof bolts are placed on a minimum of 3' centers
New slope has minimum vertical clearance of 7' from top of rail to bottom of bolt; minimum width, 12'
Treated planks 4"x8", 12' long used where weak rock requires additional support
BEFORE
AFTER

FIG. 3—HAULAGE SLOPE BEFORE AND AFTER, showing conditions and support before and after rebuilding.

NEW HAULWAY FOR NO. 1

Other than more-adequate ventilation, one of the most-urgent needs was a new haulageway for No. 1 mine. The old haulageway was in a poor state of repair, badly graded, expensive to operate and a production bottleneck. It would have cost nearly as much to repair it as to build a new one. Therefore the decision was in favor of a new haulageway into No. 1 mine as one of the first steps in rehabilitating and building up the property.

Starting at the tipple, the old haulway consisted of a 1,200-ft hoistway in the seam, a motor road for 8,200 ft and then the 3,600-ft main slope. The new haulageway eliminated the hoistway to the outside and thus reduced the haulage crew by six men on three shifts from the former total.

The new layout starts with a motor road on a favorable grade 8,800 ft from the tipple to the main slope. The first 1,800 ft is on the surface, then comes a 2,000-ft rock tunnel and finally a 5,000-ft section in the seam. To arrive at the desired grade and to provide adequate height, an average of 2½ ft of rock was taken in the coal section either above or below the seam.

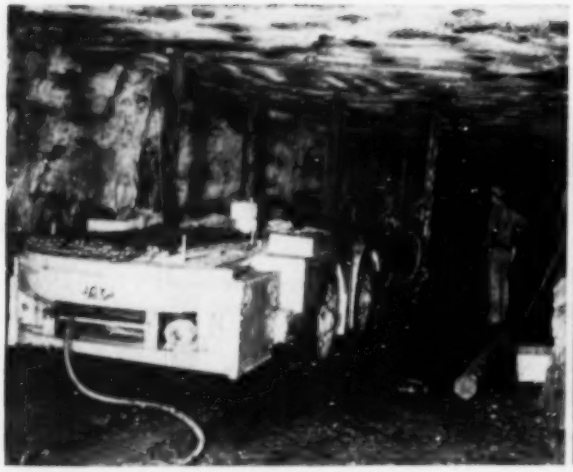
The new track consists of 80-lb welded rails, tie plates, treated ties and heavy rock ballast. Clearance is maintained at 3 ft on each side, and the minimum vertical clearance is 7 ft. The sidetracks at each end of the new haulway can accommodate 50-car trips. Cars hold 5 tons each. The travel speed is 10 mph and a round trip takes 25 min.

Considerable study was given to the matter of grade, and it was finally decided to use an average of 3/10% in favor of the loads. This proved to be right for the locomotive, with power full on, to make the same speed with an empty trip as with a loaded one. Level track was provided at the outside end for approximately 2,000 ft for ease in accelerating the empties, decelerating the loads and parking trips on the yard tracks.

The sidetracks at the inside end also were graded to facilitate parking and interchanging trips between the hoistway and the main line. The new haulageway has at least tripled the capacity of the old one. Approximately 3,500 tons per shift can be hauled 2 mi by one man using a 15-ton locomotive.

The main slope also is being rebuilt as part of the No. 1 haulage-improvement program. The existing 45-lb rail is being replaced with 80-lb, employing the same construction as on the motor road. Turnouts are No. 6 and all other design features are planned for high speed and long life.

Roof support is being improved by taking down 4 ft of loose top coal and replacing the sagging crossbars with treated planks bolted to the roof rock.



BOLTING A SUNNYSIDE MAINSTAY, as in No. 2 mine aircourse where new machine is shown in operation.

BOLTING RESULTS— raise aircourse in No. 1 mine after cleaning and bolting with wood crossbars.

CONTRASTS IN CONDITIONS—old abandoned motor road in No. 1 mine before bolting (left) compared to bleeder aircourse in No. 2 mine after cleaning and bolting for better air circulation with less maintenance.

To avoid increasing the height of the entry to a point where additional crushing of the pillars would occur, with resultant hazardous ribs, 3 to 4 ft of loose coal is being left on the bottom as side support for the pillars.

GENERAL IMPROVEMENTS

The mine water system for the property has been rebuilt in large part by the replacement of many of the water mains with cast-iron pipe of adequate capacity. A 300,000-gal steel tank was installed to replace two old 50,000-gal wood tanks. In making these replacements, the water systems for the three mines were tied together and simplified. The washing plant and coke-oven operations are no longer hampered by delays resulting from lack of water, maintenance of the main pipe lines has been practically eliminated, and the power consumption for pumping has been reduced.

The electrical system also has been improved. A substation was relocated to make way for the new haulageway and additional yard facilities—and to accommodate additional transformers. The No. 2 mine substation was moved 4,000 ft closer to the portal to improve the voltage, reduce loss of power in transmission, and provide more-reliable service. The old location was at a remote point, and considerable time was consumed in restoring service after a short circuit.

Sunnyside has 300 late-type houses built since 1943, and 143 older units built from 1900 to 1918. As part of the rehabilitation program, all the late-type houses were repainted inside and out, wood porches were replaced with concrete and miscellaneous repairs were made. In addition to being repaired and painted inside and out, the older houses are being equipped with modern plumbing, bathrooms and connections with the sewage system. This program will later include landscaping, improved sidewalks, curbs and hard-surfaced streets.

As at most western mining operations, good culinary water is not plentiful at Sunnyside. This need was adequately met by constructing a dam on a nearby mountain stream. The reservoir thus formed holds back 1,000 acre-feet of water from the spring runoff each year for use in the dry season in the summer and fall. An old pump station and 5 mi of pipe lines that were expensive to operate and maintain were eliminated. The project was undertaken in partnership

with a neighboring operator experiencing a similar water shortage.

Increasing Production

The preceding material has been devoted largely to some of the major features of what we call the rehabilitation program at Sunnyside. By March, 1952, after the improvement work was well under way, the decision was made to proceed with the expansion of production. Sunnyside had been producing sufficient coal for two blast furnaces and 297 beehive ovens, or approximately 1,000,000 tons a year. The third blast furnace boosted demand to 1,715,000 tons per year.

In this connection, it might be pointed out that Kaiser Engineers, a division of Henry J. Kaiser Co., is directly responsible for design and construction, and the procurement of all new facilities, in connection with the expansion of steel-making facilities at Fontana, Calif. In addition to the third blast furnace and 90 new by-product ovens, the program includes a new power plant, openhearth plant, soaking pits, blooming mill, hot-strip mill, shops and utilities.

Kaiser Engineers also is responsible for the design, construction and procurement of all new facilities at Eagle Mountain ore mine and Sunnyside coal mines. The total expenditure will be $65,000,000, of which $5,000,000 will be spent on Sunnyside coal-mine facilities. These include 70 new houses, sewage-treatment plant, change house, washing plant, mine hoist, 20 mine cars, four locomotives and other underground mining equipment.

HOW HIGHER PRODUCTION IS BEING ACHIEVED

Naturally, one of the major considerations in expanding production was maximum efficiency. Wherever possible, it has been planned to get more coal by improving the service to existing mining crews, thus minimizing the number of additional crews and the quantity of equipment required. Some of the steps to this end are:

1. Improved roof control by the use of bolts instead of timber.

2. Elimination of delays resulting from waiting on cars. This has been a chronic difficulty caused by lack of capacity and storage at the preparation plant, and by haulage bottlenecks.

3. Elimination of separating rock at the face. At present, the raw coal averages 20% rock, with some sections producing as high as 40%.

4. Elimination of delays at the face growing out of inadequate ventilation.

5. Improved utilities, such as, power distribution and water systems.

6. Transfer of men and equipment to more-productive sections when aircourse and haulage-improvement projects are completed. One of the principal gains in production is expected to come when only a normal amount of effort will have to be devoted to development and improvement work.

The six steps outlined immediately above are expected to add 300,000 tons per year to production without any appreciable increase in manpower.

The additional 400,000 tons per year will be gained by adding mining sections. At the time of this writing, 16 fully equipped sections are producing—six in No. 1 mine and 10 in No. 2. On the basis of 1,300,000 tons per year from 16 sections, it is calculated that each section will produce 81,250 tons per year. Therefore, to get 400,000 tons additional, five more sections are being added.

WHERE PRODUCTION IS TO BE INCREASED

At the time the program for the third blast furnace was initiated, No. 1 mine, with six sections, was producing 1,500 tpd, and No. 2, with 10 sections, 2,900 tpd, or a total of 4,400 tons. On the basis of 226 working days per year, future average daily production will be 7,600 tons.

Since the best coal reserves on the property lie in No. 1 mine, it was decided to obtain as much of the increased production there as possible. The coal in No. 1 mine is cleaner and mining conditions are more favorable. However, it was recognized that too-large a mine loses in efficiency. In view of the natural conditions at Sunnyside, such as, varying seam thickness, gas, water, faults and steep pitches, we believe that a mine producing 3,500 tpd is the best for efficient supervision and operation.

Also, of course, there is a limit to the reserves available in the No. 1 area, and if too high a percentage of the coal was to be secured there, the mine would soon be worked out before the increased investment necessary for the higher tonnage could be recovered. As a result, it was decided to set No. 1 mine up for a production of 3,400 tpd, using eight sections.

We have depended heavily upon No. 2 mine to supply the bulk of production during the construction phase at the other two. However, the hoist in No. 2 has been operating close to capacity, which capacity will naturally decrease as the slope deepens. Because of this—and the bad top—it was decided that No. 2 mine should be counted on for only 2,400 tons. This can be secured from eight sections.

Although No. 2 mine was in fairly good condition when Kaiser took over, considerable work has been done to bring it up to new high standards consistent with long-term planning. Otherwise, No. 2 is comparatively unaffected by the expansion program, except as it benefits from the improved service made possible by the new tipple and rock-handling facilities, telephone and power systems, and so on.

OPENING NO. 3

It was decided that the best place to obtain the remaining 1,800 tons of capacity was from the area near the center of the property, now designated as No. 3 mine. Although this area was first opened in the lower seam by the Utah Fuel Co., it was soon abandoned because of dirty coal, lack of washing equipment, and ample clean-coal reserves in other locations. The washing plant now being installed makes it possible to mine this coal which, in the worst areas, averages 15 to 25% sink and is not acceptable by present standards.

After abandoning the lower seams, varying from 5 to 9 ft in thickness, Utah Fuel worked the upper seam quite extensively. In this area, the rock separation runs from 15 to 40 ft and is expected to give some difficulty in roof control as a result of the upper seam being partly mined. However, the immediate roof is fair and 4-ft bolts on 5-ft centers are expected to provide adequate roof support in entry work without supplemental timbering. Normal posting should be sufficient in room and pillar work.

The principal items in the project for re-opening No. 3 are:

1. Rebuild portal and main-haulage slope to provide better roof support, increased clearance and improved profile.

2. Clean up 15,000 ft of old entries and improve roof support.

3. Relay approximately 10,000 ft of track.

4. Replace power, water and communication lines.

5. Rebuild stoppings and overcasts.

6. Clean up approximately 3,000 ft of caved entries.

7. Dewater the old working—approximately 2 billion gal to be pumped.

The mine will be equipped with five working sections by the time the rehabilitation work is completed. It is estimated that they will produce 1,800 tons per day, thus completing the requirements of the expansion

program for the new blast furnace.

HOISTING

The existing hoist in No. 1 mine is a 450-hp unit and pulls a trip of 8 cars at a speed of 800 fpm. To handle the increased production from the eight sections and to permit deepening the slope at a rate of 400 ft per year, a new hoist has been ordered able to pull 14 cars at a speed of 1,400 fpm. This hoist will have a 10x10-ft drum accommodating 15,000 ft of 1½-in rope. Installed underground, it will be driven by two 500-hp AC wound-rotor motors and will have dynamic braking.

COMMUNICATION

Special attention has been given to adequate communication. The old mine telephone system consisted of a party line of 15 to 20 phones in each mine. Even before expansion was contemplated, the operation had outgrown the system. To provide the best service possible for the enlarged operation, a new telephone system is being installed both above and below ground by the Mountain States Telephone & Telegraph Co. The latest in automatic dial-telephone equipment is being used, and each phone will be served by a private line. This the first installation of its type in an underground operation in the territory.

Sunnyside Preparation

Prior to 1942, none of the coal mined at Sunnyside was hand-picked or washed. This was possible because of selective mining with no mechanical loading. Most of the coal was crushed to approximately 1⅝ in and was coked in beehive ovens at the mine. In 1942, the old preparation plant was dismantled and a modern washing plant, designed to handle 350 tph, was built.

In this plant, which is still in operation, the raw coal is received through two rotary dumps located on parallel tracks. One dump handles locomotive coal trips from the present No. 2 mine and is equipped with a mechanical car feeder. The other handles rope trips from No. 1 mine. A car feeder is not used with the No. 1 dump and cars are dumped in both dumps without uncoupling.

From a 75-ton surge hopper under the dumps coal is fed to a 36x54 single-roll crusher set at 8 in. A 36-in belt then carries it directly into the washing plant. In the plant, the coal is passed over a shaking screen for separation into plus and minus 4-in. The plus 4-in is hand-picked on the lower end of the screen, which is blanked off for this picking purpose.

Minus 4-in coal goes to a 5-cell Baum-type jig and then over a three-deck dewatering screen, where the plus ⅜ is separated and loaded directly into railroad cars or sent to the clean-coal stockpile. Minus ⅜ is further dewatered by a 60-ft settling cone, two centrifuges and two dewatering screens. The primary function of this plant is to provide coking coal for the first blast furnace at Fontana. Some coal was prepared for the local commercial market and the beehive ovens at Sunnyside.

In 1949, a second blast furnace was added at Fontana and created an additional demand for coking coal. Various methods of increasing plant capacity—all costly—were considered. In the final analysis, it was decided to increase the load on the existing facilities to meet the demand and do the best-possible job of cleaning the coal.

The load on the wash box was increased to 350 tph, and instead of washing 3x0 the size was stepped up to 4x0. More pickers were added to hand-pick the plus 4-in. Plant maintenance was greatly increased and breakdowns were frequent. However, by careful watching and having an adequate supply of spare parts on hand, the plant continues to operate satisfactorily and a product suitable for coke-making is obtained.

With the addition of the third blast furnace and 90 new coke ovens at Fontana, it became imperative that new facilities be added for preparing the coal if reasonable quality was to be maintained.

EXPANDING PREPARATION

In planning the necessary facilities to provide for increased coal requirements, many flowsheets were considered and, in the final analysis, simplicity in design and ease of maintenance were dominant factors in making the final selection. Freight rates also were considered, since it costs as much to ship a ton of rock to Fontana as a ton of coal.

The problem of expanding present preparation facilities was divided into two parts:

1. Dumping, crushing, blending and storage.
2. Washing and dewatering.

Kaiser engineers have designed and are now in process of constructing the first part of the job. They also are constructing the thickener and foundations for the washing plant. A subcontractor is designing, furnishing and constructing the washing plant proper under the supervision of Kaiser engineers.

Dumping capacity will be increased by installing a new rotary dump capable of handling 900 tph in place of the existing No. 1 dump, which will be utilized as a rock dump on the same track. The existing No. 2 dump will be used in conjunction with the new one until some future date, when the one dump will handle the entire tonnage. The existing dump then will serve as a spare.

Crushing capacity will be increased by removing the primary single-roll crusher and installing a 27x12-ft rotary breaker with 6-in openings in the screen plates. The reason is that a considerable quantity of hard rock in large pieces is loaded with the coal. The rotary breaker will eliminate a good portion, as well as pieces of ties and timber, before the coal reaches the washing plant, thus lightening the washing load and also serving as a positive sizer, which will be conducive to better washer operation. The breaker also will eliminate the existing raw-coal screens.

BLENDING INCLUDED

The 6x0 coal from the rotary breaker will be carried on a 48-in belt to a 16-cell reinforced-concrete blending bin. Bin capacity is 3,500 tons, and the design and location is such that additional cells can be added if necessary. Individual variable-speed vibrating feeders are to be attached to the bottoms of the bin cells—one feeder for each two cells.

These bins are an important part of the new plant. They provide surge capacity between the mines and the washing plant as well as blending. Coal from the blending plant will be fed to the washing plant over a 48-in belt at a rate of 650 tph. Washing and dewatering capacity will be increased by installing two new 6-cell Baum-type jigs. Each jig will receive raw coal at a rate of 325 tph. Middlings products from both jigs will be crushed and rewashed in the existing jig. Existing washed-coal screens will be remodeled, and two new 5x14-ft low-head dewatering screens will be added.

To increase thickening capacity, a new 120-ft thickener and drag tank will be added. Underflow will be pumped to a slurry-mixing tank and then to two new vacuum disk filters, 8 ft 10 in in diameter, eight disks, each unit with 823 sq ft of filtering area. One new centrifuge to work with the two already installed will be added to handle ⅜x48-M material from the drag tank. All sizes from the various units in the plant will be dumped on a drag-type mixing con-

veyor for loading on any one of the three tracks.

The existing stocking-out conveyor is being remodelled so that it will be capable of storing washed coal on the ground at a rate of 650 tph. By using a bulldozer to spread the pile, 30,000 tons can be stored conveniently. This storage facility is a valuable part of the plant since it permits the mine to work whenever there is a railroad-car shortage. Coal can be recovered from the pile without interference with the washing plant when it is in operation.

REFUSE DISPOSAL

Straight rock coming from mine cars will be handled through the rotary dump near by and on the same track as the coal dump. One man will operate both dumps. Cars will not be uncoupled for dumping and can be mixed in with coal cars. This feature will increase the capacity of the main haulage. A car feeder will automatically spot the car to be dumped. Refuse from the rock dump, rotary breaker and washing plant will be fed to trucks through power-operated undercut gates and will be hauled 1 mi to the waste dump.

Other Improvements

Power is purchased from the Utah Power & Light Co. at 44 kv. A substation is located at the head of each slope, where the voltage is dropped to 4,160 and taken into the mine. As a result of the heavy demand of the hoist in each mine, hoist power is taken in by separate cables to avoid voltage fluctuations in the mining sections.

No. 2 already is equipped with a voltage regulator at the underground load center and a similar installation is being made in No. 1. In each instance, 4,160-v power is taken from the regulator by 3-conductor rubber-covered cables to the power centers near the loaderheads in each section. Power at 500 v DC for trolley locomotives in each section is supplied by three m-g sets in No. 1 mine, two mercury-arc rectifiers in No. 2 mine and an m-g set in No. 3 mine.

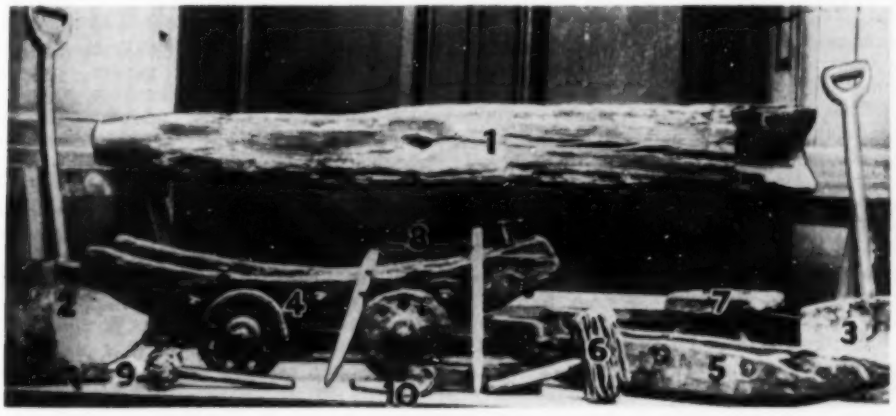
The 40-yr-old change house is being replaced with a new building that will serve both Nos. 1 and 3 mines as such, and as a lamproom, superintendent's office and a place for meetings and training programs. The building is designed for hard wear, with considerable thought being given to minimize upkeep and maintenance work.

HOUSING

Seventy new houses, as previously noted, are being added. Construction is masonry, using volcanic-ash blocks. All new houses will have full basements, furnace heat, hardwood floors, electric hot-water tanks and other conveniences not always found in mining towns. A variety of sizes will include one, two and four bedrooms.

A new sewage plant will be built and is designed to provide 92% removal of suspended solids and biochemical oxygen demand. All bacteria will be destroyed with large doses of liquid chlorine in the final treatment.

The major phases of both the underground development program and surface construction should be completed at Sunnyside by August, 1953, and the benefits will begin to be realized. Of course, the proof of the pudding is in the eating, but it is believed that Sunnyside will emerge as one of the most modern and efficient coal producers in the West.



Mining Coal 275 Yr Ago

WHEN AMERICA STILL WAS A COLONY, nearly three centuries ago, Englishmen were mining coal to warm their homes. How much they prized their coal, what hardships they endured to mine it and how far mining machines and methods have advanced since that time comes out in the photograph above.

The collection of ancient mining equipment and tools shown in the picture is displayed at King's College, University of Durham, Newcastle-on-Tyne, England. Part of the collection was gathered by Thomas Allen, now chief inspector of coal mines, Denver, Colo., and his father, and was given to King's College about 1905.

The tools and equipment are identified as follows:

1. Wooden pump, Delight mine, Dipton, County Durham.
2. Wooden shovel, Delight mine.
3. Wooden shovel, estimated 275 yr old, Preston colliery, North Shields, Northumberland.
4. Tram, estimated 185 yr old, Bluebell pit, Shiremoor, Northumberland.
5. Sled, estimated 275 yr old, Preston colliery.
6. Wooden mallet, old Durham colliery.
7. Coal hewer's stool, or "cracket," estimated 275 yr old, Preston.
8. Wooden tally sticks or tokens.
9. Pick and hammer, Bluebell pit.
10. Part of rail showing junction point, estimated 185 yr old, Bluebell pit.

The 1953 Coal Show . . .

New Opportunity for Coal Men

L. C. CAMPBELL
Chairman, Coal Division

RAYMOND E. SALVATI
Chairman, Program Committee

JOHN P. COURTRIGHT
Chairman, Manufacturers' Division

PROGRESS in coal mining directly reflects the collective thinking and efforts of mining men and the developers and manufacturers of equipment and materials. Much has been done by each of these groups, and it is recognized that much more must be done if coal mining is to take its rightful place in our industrial progress.

The Mining Congress Coal Show sets the stage for another step forward. An outstanding industrial exposition is backed up by a program organized by practical operators and manufacturers. Thus, the Coal Show provides an excellent opportunity to note progress.

Cost, quality and safety were never more important than today. These are the keynotes of the 1953 show—the threads that tie together the technical papers by experienced coal men and the product exhibits by manufacturers well acquainted with industry needs. The Coal Show also aims at progress through building employee and public goodwill and apprising them of the scope of the coal industry and its rightful place in powering American industry at a reasonable profit.

The 1953 Coal Show is so outstanding no coal man should miss it. I urge you to come to Cleveland, hear the papers, study the exhibits and exchange ideas with other mining men and the exhibitors. Coal has powered America in peace and war. You, your company, the industry and the Nation need to recognize the part the Coal Show plays in dramatizing coal as a dependable all-time life thread of American industry.

I KNOW you will want to attend the 1953 Coal Show in Cleveland and I sincerely believe that you will want to sit in on the technical sessions in addition to taking in the exhibits. I say this because your committee has had only one goal in mind in preparing the Coal Show program: maximum practical help in meeting today's problems in mining and in laying the foundation for future progress.

Consider the subjects to which practical-minded men will speak: continuous mining, roof-bolting, pillar extraction, dust control, mine bumps, high-capacity track haulage, belt conveying, operation in thin coal, continuous transportation, degasification of coal seams, and many others. One complete session will be devoted to coal preparation, and two sessions to such important phases of strip mining as truck haulage, trends in dipper size, highwall drilling and so on. Another session will go into handling of labor disputes, management problems and stream sanitation. The emphasis will be on both tried and proven ideas, and on new ideas and developments that promise benefits for coal mining in the future.

Plan now to reserve time for the technical sessions. There will be a wealth of ideas for all—executives, managers, superintendents, foremen, and electrical, mechanical, maintenance and safety men. They will be good ideas that will benefit both you and your company. All the technical sessions will be open and I urge that you come, listen and participate.

MORE THAN 250 manufacturers will put on the greatest display of mining machinery and operating materials and supplies ever assembled at the 1953 Coal Show. Here is your chance to see, study and compare everything that manufacturers offer for safe, economical mining and preparation. Cleveland's huge auditorium will be packed end to end with exhibits, with many extra-large items outside.

Remember, this is the real thing. Most of the equipment and materials will be there life size—a lot of it in full operation. In addition, there will be cutaways, models, graphic demonstrations and everything else manufacturers can conjure up to show what their products can do for you. Equally important is that their highly trained mining men and technicians will be on hand to explain, answer questions and discuss your particular problems.

May I urge, first, that you come to Cleveland; second, that you come prepared to take full advantage of this Coal-Show opportunity. Think about your needs for equipment and materials and plan to check every exhibit, since an answer may turn up where you might not expect it. Each exhibitor is at Cleveland because he has something for the coal industry. You may not have a place for some of the products today, but tomorrow they might be the solution to a pressing problem. Plan now to spend as much time as possible at the show. The next one is not until 1955. We all will welcome the opportunity of helping you solve your problems.

The 1953 Coal Show . . .

What the Program Offers

MONDAY MORNING, MAY 11

Roof Support and Pillar Recovery

A Summary of Roof-Bolting Developments—H. E. Knight, Bell & Zoller Coal & Mining Co.; J. C. Hunter, Powellton Coal Co.; E. R. Cooper, Jones & Laughlin Steel Co.

Pillar Extraction Under Heavy Cover—R. F. Bowie, Union Pacific Coal Co.

Pillar Extraction in Anthracite Mining—Robert M. von Storch, The Hudson Coal Co.

TUESDAY MORNING, MAY 12

Mechanical Mining

Maximum Extraction in First Mining—Mack H. Shumate, Truax-Traer Coal Co.

Mechanical Mining in Thin Seams—W. J. Shields, Rochester & Pittsburgh Coal Co.

Specifications for Efficient Face Preparation—Emmett H. Lang, Powhatan Mining Co.; Wm. L. Husk, West Kentucky Coal Co.

Safety

Degasification of Coal Seams—G. R. Spindler, School of Mines, West Virginia University.

Coal-Dust Sources and Control Underground—James Westfield, U. S. Bureau of Mines.

Coal-Mine Bumps—Causes and Prevention—Charles T. Holland, Department of Mining Engineering, Virginia Polytechnic Institute; H. E. Mauck, Olga Coal Co.

TUESDAY AFTERNOON, MAY 12

Strip Mining

Coal and Overburden Haulage—Panel Discussion—F. W. Chesney, Shenn-Penn Production Co., chairman; E. E. Howard, Caterpillar Tractor Co.; R. C. Gessel, R. G. LeTourneau, Inc.; A. S. McClimon, Euclid Road Machinery Co.; Ralph H. Kress, Dart Truck Co.

Bucket and Dipper Trends—Panel Discussion—James D. Reilly, Hanna Coal Co., chairman; C. J. Polinek, Page Engineering Co.; Karl Schneider, Harnischfeger Corp.; R. M. Dickey, Bucyrus-Erie Co.; A. F. Busick, Marion Power Shovel Co.; P. V. Larsen, Electric Steel Foundry Co.

WEDNESDAY MORNING, MAY 13

Management

Fifty Years of Handling Labor Disputes—Thomas F. Larkin, Anthracite Board of Conciliation.

Central Management v. Unit Supervisory Control—Paul Weir, Paul Weir Co.

Stream-Sanitation Problems in the Ohio-River Valley—Panel Discussion by Members of the Coal-Industry Advisory Committee—E. R. Price, Inland Steel Co., chairman; H. F. Hebley, Pittsburgh Consolidation Coal Co., secretary; James Hyslop, Hanna Coal Co.; J. J. Foster, Island Creek Coal Co.; T. C. Cheasley, Sinclair Coal Co.; W. L. McMorris, Coal Div., U. S. Steel Corp.; L. E. Sawyer, Indiana Coal Producers' Association.

Haulage and Power

High-Capacity Track Haulage—D. H. Davis, Mathies Coal Co.; Frank LaRoche, Snow Hill Coal Corp.

A Complete Belt Mine—Jos. Craggs, Peabody Coal Co.; H. A. Jones, Carbon Fuel Co.

Reversed Polarity for Mine Circuits—H. B. Buckingham, Tennessee Coal & Iron Div., U. S. Steel Corp.; Elton L. Parker, Westinghouse Electric Corp.

WEDNESDAY AFTERNOON, MAY 13

Strip Mining

Symposium on Highwall Drilling: General Problems—Fred Horne, Sinclair Coal Co.

Horizontal Drilling—Marlin Carter, Ayrshire Collieries Corp.; Merle Busby, Ozark Philpott Mining Co.

Vertical Drilling—Robert Akre, Maumee Collieries Co.; Gene H. Utterback, United Electric Coal Cos.

THURSDAY MORNING, MAY 14

Continuous Mining

A Review and Forecast of Continuous Mining—M. H. Forester, Pittsburgh Consolidation Coal Co.; H. B. Wickey, Pennsylvania Coal & Coke Corp.

Continuous Haulage for Continuous Mining—James D. Sutton, Clearfield Bituminous Coal Corp.; W. B. Jamison, Jamison Coal & Coke Co.

Remotely Controlled Bore Mining—P. L. Alspaugh, Carbide & Carbon Chemicals Co.

THURSDAY AFTERNOON, MAY 14

Coal Preparation

Mine Operating Factors That Affect Coal Preparation— R. L. Llewellyn, Eastern Gas & Fuel Associates.

Anthracite Fine-Coal Cleaning at the Coaldale Plant—W. T. Turrall, Lehigh Navigation Coal Co.

Bituminous Fine-Coal Cleaning in West Virginia—Matthew Turkovich, Island Creek Coal Co.

Coal Preparation With New-Type Heavy-Media Operation—J. B. Taggart, Wise Coal & Coke Co.

SPECIAL EVENTS . .

Manufacturers' Div. Meeting, Monday Afternoon.

Baseball Nite, Monday Evening.

Coal Miners' Party, Tuesday Evening.

King Coal Theatre, Thursday Evening.

The 1953 Coal Show . . .

What's What in Equipment

Here is a preview of the equipment you'll see at the 1953 Coal Show—the largest exposition of mining machinery, equipment and supplies ever held under one roof. It lists not only the old-reliable items but also the new machines and products developed for quality, efficiency and safety.

This section is prepared for your use before you go to Cleveland. Exhibits are classified by product, the new items are highlighted, and booth numbers are given after the company names for your convenience. Check now to save time and footwork later, and to make sure you'll see the things that you are especially interested in.

Stripping

Aero Service Corp. (640)—Aerial photos, photo-maps and topographic maps for strip mining, emphasizing use in estimating coal acreage, delineating crop lines, plotting overburden, inventorying timber, locating spoil dumps, plotting property lines, planning rail spurs and redevelopment, and facilitating geological study.

NEW—Accurate volumetric computation of coal and ore dumps by aerial surveys.

American Cyanamid Co. (1224)—American "Container-Cartridge" shipping and loading cartridge for strip mining.

NEW—Plastic wire for better visibility and safety.

Atlas Powder Co. (1400)—Rockmaster blasting methods, including basic principles of blast-hole detonation.

Baldwin-Lima-Hamilton Corp., Construction Equipment Div.—Lima shovels, cranes and draglines.

Bethlehem Steel Co. (306, 314)—Hollow drill steel.

Bucyrus-Erie Co. (332) – Stripping shovels and draglines, loading shovels, blasthole drills and the Hydrocrane, featuring the 150-B shovel.

Cardox Corp. (2003-7, 1902-6)—145-hp surface Augerminer with augers up to 36 in; vertical drills and other standard drilling equipment.

Caterpillar Tractor Co. (1500) – 2-wheeled 225-hp DW21 tractor with 20-yd No. 21 scraper.

Central Mine Equipment Co.—Complete line strip-mine augers.

Compton, Inc. (550)—Model 32 Compton auger, smaller in size and weight and designed primarily for operation in narrow pits. Powered by a 150-hp Cummins diesel, the new model drills a 28- to 42-in hole and is equipped with seven 20-ft auger extensions. Features include integral conveyor with turret-discharge chute; roller-bearing supports for augers, drum and cable drive; pilot and spillage pan; swiveling pontoons; overhead hoists for augers; and Compton patented high-speed cutter head.

NEW (Booths 329, 331)—Compton high-speed cutter heads for augers.

Robert A. Cummings Jr. & Associates (1606)—Aerial mapping and equipment.

E. I. du Pont de Nemours & Co., Inc. (207)—"Nitramon," blasting accessories.

Electric Steel Foundry Co. (1539)—NEW 6-yd all-welded double-tapered dragline bucket; R7 series box-type points and adapters for draglines; hinge-type chain-repair link; long-bowl wire-rope socket.

Firth Sterling, Inc.—Complete line strip-miner auger bits; also throwaway percussion bits and drill steel.

Hendrix Mfg. Co. (1216)—Latest-model dragline bucket featuring cast 14% manganese lip, chains and fittings.

Hercules Powder Co.—Stripping explosives and blasting accessories.

Kennametal, Inc.—Carbide bits and augers.

Koehring Co. (1809)—Koehring excavators in capacities up to 2½ yd.

R. G. LeTourneau, Inc. (1532-36)—Model C Tournapull, P-19 Carryall scraper.

LeRoi Co., Cleveland Rock Drill Div. — LeRoi 105-cfm tractor-compressor combination with "Mobildrill" attachments.

Link-Belt Speeder Corp. (108)—Shovel-crane applications featuring power hydraulic controls and 2-yd K-375 shovel-crane.

Marion Power Shovel Co. (1003)—Stripping and loading equipment, featuring the 7400 10- to 13-yd walking dragline, 191-M 10-yd shovel, world's largest on two crawlers; and the 7800 machine with 35-yd bucket on a 220-ft boom.

Mobile Drilling, Inc. (214)—Portable combination auger- and rotary-type prospecting drills to fit 4-wheel-drive vehicles.

NEW—Mobile drill for auger and core drilling, truck, trailer or skid; capacity, 550 ft of hole; double hydraulic cylinder, other mechanical features.

Northwest Engineering Co. (1415)—Mining shovels, cranes and draglines.

Page Engineering Co.—Page Automatic dragline buckets.

Pioneer Engineering Works, Inc. (2346-48)—Conveyor equipment for handling and processing overburden.

Reich Bros. Mfg. Co. (1609)—NEW portable hydraulic rotary prospecting drill for fishtail or diamond core drilling; mounted on Ford F5 truck.

Salem Tool Co. (1107-11)—NEW McCarthy heavy-duty highwall auger drill, boring pressure 100 lb per sq in, hydraulic jacks for leveling, good speed in hard stone; McCarthy vertical-auger shothole drill; McCarthy coal-recovery drill.

Varel Mfg. Co.—Varel vertical rotary-rig drilling machinery, featuring the air-blast drilling principle; also Varel quarry bits.

Winter Weiss Co.—Portadrill display, including track-mounted single-unit rotary equipment, featuring the air-blast model; also rock bits and finger-type bits.

Tractors and Tractor-Shovels

Allis-Chalmers Mfg. Co., Tractor Div. —Ts-300 motor scraper, HD-20G and HD-15G crawler tractors, and the AD-40 motor grader.

Caterpillar Tractor Co. (1500)—D8 130-hp diesel tractor with No. 90 27-yd scraper, No. 88 bulldozer and Nos. 24 and 25 cable-control units; tractor with No. 28 ripper, No. 25 cable control, No. 46 hydraulic control unit and Fleco rock-rake attachment; and a complete line of rubber-tired equipment, including 4-wheeled 225-hp DW20 tractor with W20 25-yd wagon, and No. 112 motor grader.

NEW—Caterpillar No. 6 shovel featuring standard 2-yd bucket mounted on a 66-hp track-type tractor.

Electric Steel Foundry Co. (1539)—NEW dozer-rooter for heavy-duty tractors.

Frank G. Hough Co. (1540)—Models HR and HM 4-wheel-drive Payloaders and Model HF rear-wheel-drive Payloader.

International Harvester Co. (2355)—TD-24 crawler tractor with bulldozer; TD-18A crawler tractor with Drott loader; TD-9A with Lodover shovel; Drott "Bull-Clam."

R. G. LeTourneau, Inc. (1532-36)—

Super C Tournatractor, bulldozer blade.

Oliver Corp. (2459)—Oliver wheel tractor with Strait-Line loader.

NEW—Oliver OC-18 tractor, 133 hp, air steering, equipped with rear power-control unit and Heil cable-operated Trailbuilder.

Trucks, Engines, Generators

Buda Co. (618-20)—8-DAS-1125 heavy-duty diesel engine with Twin Disc torque converter especially for large trucks; 6-DAS-844 diesel with Torcon converter for powering 2- to 2½-yd shovels; 6-DAS-844 supercharged diesel for trucks and haulage units; 6-kw diesel-electric generator set.

NEW—8-DAS-844 power unit with torque converter.

Caterpillar Tractor Co. (1500)—D397 electric set, 315 kw intermittent; D318 electric set, 60 kw intermittent; 225-hp D337 diesel engine.

Cummins Engine Co., Inc. (1646)—200-hp Model NHB-600 horizontal diesel engine for underground locomotives; 550-hp Model NVHS-1200 diesel for excavating equipment, generator sets and off-highway trucks.

Dart Truck Co.—NEW Model 145 60-yd bottom-dump coal hauler, and new Model 30 30-ton dump unit.

Detroit Diesel Engine Div., General Motors Corp. (1628-34)—Three "71" series diesel engines, 3- and 6-cylinder models for loaders, power shovels and heavy haulage units; 6-110 diesel, highest-horsepower single-engine unit.

Euclid Road Machinery Co. (1629-39, 1718-28)—40-ton single-tire Euclid coal hauler, 10-speed transmission or Allison torque converter and semi-automatic transmission, hydraulic booster steering; 22-ton Euclid rear-dump, torque converter and semi-automatic transmission, hydraulic booster steering.

Hercules Motors Corp.—Representative engines from its line of 68 models—2-, 4-, 6- and 8-cylinder gasoline and diesel, 3 to 500 hp, including types for deep-mine equipment.

International Harvester Co. (2355)—Diesel engines, coal-type trucks.

Koehring Co. (1809)—Koehring 6-yd off-highway haulage unit with equal speed of travel in each direction.

R. G. LeTourneau, Inc. (1532-36)—E-18 Tournarocker, Model C Tournapull.

Murphy Diesel Co. (1114)—Engines and generator sets, featuring 100-kw DC coal-mine compounded unit.

Twin Disc Clutch Co. (1208)—NEW two-stage hydraulic torque converter, new two-speed transmission to extend performance of three-stage converter.

Mechanical Mining

Cardox Corp. (2003-7, 1902-6)—NEW high-capacity underground Augerminer.

Clarkson Mfg. Co. (1623, 1712)—Low-vein rubber-tired loading machine, 30 in high, 72 in wide, 27 ft long; head may be raised and lowered, swung left and right; new-type digger chains; rear conveyor may be raised and lowered, swung left and right, equipped with universal conveyor mechanism.

Coal Mine Equipment Sales Co. (2410)—Rebuilt loading machines.

Frontier Bronze Corp. (336)—Aluminum shaker conveyor, light weight, new drive principle.

Goodman Mfg. Co. (2343-2443)—Pictorial presentation of Type 2600 miner and Goodman-McKinlay miner.

NEW—Type 865B permissible tractor-tread loader, 26½ high, 8 tpm; type 666B permissible tractor-tread loader with swing-motion elevated chassis for road clearance and straight rear conveyor with link-type suspension; Type L-14 permissible low shaker drive with high capacity and winch for moving.

Jeffrey Mfg. Co. (2543-55)—Colmol continuous-mining machine.

Joy Mfg. Co. (2320-32, 2425, 2525, 2625)—NEW—Three continuous miners, three new loading machines, new underground auger, new cutter-loader-shuttle car team.

Lee-Norse Co.—Two continuous mining machines, one for 5- to 9-ft coal, the other for 40- to 60-in coal.

LeRoi Co., Cleveland Rock Drill Div. — Cleveland Rock Drill continuous miner.

Mining Progress, Inc. (125-29-33-37)—NEW "Loebbe-Hobel," German steel conveyor and planer for continuous mining in low beds.

Salem Tool Co. (1107-11)—Deep-mine coal-recovery drills.

Face Preparation

Acme Machinery Co. — Rubber-tired and stationary compressors.

American Cyanamid Co. (1224)—American "Container-Cartridge" shipping and loading cartridge-container; other American products, including new line of plastic wire for greater visibility and safety.

Austin Powder Co. (920)—Complete line rotary-type drilling tools, including throwaway bits and tungsten-carbide and cutting-machine bits, plus percussion-type bits for stoper work.

Bemis Bro. Bag Co. (935)—Tamping bags and Multiwall bags.

NEW—Explosive bags.

Bowdil Co. (1006)—Cutter bars, cutter chains, bits, rope sockets and picks.

NEW—No. 1-29 heavy concave bit—double-pointed throwaway-type.

Carboloy Dept., General Electric Co. (1647)—Expanded line of new mining tools, data on care and sharpening.

Cardox Corp. (2003-7, 1902-6)—Airdox equipment, standard drilling equipment.

Central Mine Equipment Co.—Complete line coal augers.

Chicago Pneumatic Tool Co.—Permissible, hand-held, post-mounted and mobile drilling units.

Cincinnati Mine Machinery Co. (2515)—Cincinnati cutter chains, bars, bits and sprockets.

Coal Mine Equipment Sales Co. (2410)—Rebuilt rubber-mounted cutters.

Dooley Bros. — Permissible mobile coal-drilling truck with latest safety devices; also various post assemblies, repair and exchange parts for Superior electric coal drills.

E. I. du Pont de Nemours & Co., Inc. (207) — Chemechol chemico-mechanical coal-breaking method, du Pont permissible explosives and blasting accessories.

Firth Sterling, Inc. — Complete line drill bits.

Fulton Bag & Cotton Mills (940)—Scotch-seam tamping bags.

Goodman Mfg. Co. (2343-2443)—NEW Type 2410 high-type rubber-mounted permissible universal cutter; hydraulically driven bugduster for bottom cutting.

Hercules Powder Co.—Permissible explosives and blasting accessories.

Jeffrey Mfg. Co. (2543-55)—Universal cutter, Jeffrey drilling machines.

Joy Mfg. Co. (2320-32, 2425, 2525, 2625)—NEW mobile coal drill, cutter bits.

Kennametal, Inc.—Carbide cutter bits, drill bits and augers.

NEW—Rotary bits and sectional threaded auger for long-hole drilling.

LeRoi Co., Cleveland Rock Drill Div. —Rock drills.

National Mine Service Co. (2409-15)—"Quick-Seal" and "Permi-Seal" tamping plugs.

Olin Industries, Inc., Explosives Div. (237)—Explosives and blasting accessories, featuring Western Cartridge blasting caps and the Armstrong Airbreaker.

Precision Chain Co. (2304)—Precision cutter chains, both standard universal types for ½x1-in bits and Multiplex type for Rockbuster-Multiplex double-end bits; also cutter bars, chain links, bits and bit holders.

NEW—Precision universal cutter chain for new Precision "Middle Track" cutter bar and new 10-tooth sprocket.

Frank Prox Co. (1204)—Cutting chains, cutter bars, cutter bits, sprockets.

Schroeder Bros. (2209) — Hydraulic hand-held coal drills and hydraulic unit

Post-Convention Report

AS A READER SERVICE, *Coal Age*, in its June issue, will present a complete report of the 1953 Coal Show, including digests of the papers and descriptions of products shown by manufacturers.

to power drill from a shortwall cutter.

Tamping Bag Co. (1019)—"Seal-Tite" wet-strength tamping bags.

Bertrand P. Tracy Co.—Cutter chains, gears, pinions.

Roof Control

Acme Machinery Co.—Complete line roof-bolting stopers and impact wrenches.

NEW rotary stoper and new government-approved dust collector.

Armco Drainage & Metal Products, Inc. (236)—Liner plate for entries, haulways and shafts.

Bethlehem Steel Co. (306, 314)—Roof bolts and hollow drill steel.

Central Mine Equipment Co.—Complete line of roof augers.

Chicago Pneumatic Tool Co.—Electric and air-operated roof-bolting equipment, including all-electrical RBD-30 mobile bolting unit.

NEW—CP-134 short stoper, wet or dry, and CP air-powered impact wrench.

Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div.—Roof-bolts.

Dowty Mining Equipment, Ltd. (2401)—NEW hydraulic pit props.

Duff-Norton Mfg. Co. (1901)—Roof jacks developed for roof-bolting.

Elreco Corp. (1401)—Elreco roof-bolting system.

Firth Sterling, Inc.—Complete line of bits for roof drilling.

J. H. Fletcher & Co.-Baker-Raulang Co. (219)—NEW Fletcher roof-drill combination with high-speed timbering attachments; new Hydro-Shift roof drill.

Irwin Foundry & Mine Car Co. (1115)—Roof drill.

Jeffrey Mfg. Co. (2543-55, 2644-55)—Jeffrey roof-drilling machines.

Joy Mfg. Co. (2320-32, 2425, 2525, 2625)—NEW rubber-tired roof-bolting drill, new air leg, plus telescopic constant-feed stopers and compressors.

Kennametal, Inc.—Carbide roof bits, both rotary and percussive, augers and pinning rods.

NEW—Two rotary bits for bolting.

LeRoi Co., Cleveland Rock Drill Div.—Roof-bolting drills and equipment.

Mine Safety Appliances Co. (1009)—NEW MSA bolt-hole cleaner.

Ohio Brass Co. (1613, 1700)—O-B expansion shells and plugs for roof-bolting, stressing holding power, torque-tension relationships, importance of hole size.

Osmose Wood Preserving Co. of America, Inc.—Osmose timber preservation; wooden mine-roof plugs.

Pattin Mfg. Co. (624)—Full line of mine roof bolts, 1-in split type, ¾-in expansion type, and accessories.

NEW—Style "D-1" expansion shell in which the wedge nut is replaced by forming wedge on the bolt.

Pittsburgh Screw & Bolt Corp. (736)—"Pit-Bolts", in both the expansion and split-rod types.

Ruger Equipment, Inc.—Hand-powered hydraulic Timberlift timber-setter.

Star Jack Co.—Aluminum screw-type safety roof jacks.

Templeton, Kenly & Co. (821)—Roof and timber jacks; post-pulling jacks.

NEW—Bevel-gear timber jack featuring increased speed of operation.

Timken Roller Bearing Co. (900-905)—Timken Rock Bits for roof-bolting.

Vascoloy-Ramet Corp., Mining Tool Div. (913)—Theme "Cut Roof-Bolting Costs," emphasizing tool grinding and handling.

NEW—DB auger drill bit.

West Virginia Steel & Mfg. Co. (2316)—Complete line roof-bolting materials, including channels, universal and flat washers, bolts, and expansion units and wedges applicable to bolts, including wedge- and plug-type expansion bolts.

Joseph Woodwell Co. (835)—NEW Ruflok compound for sealing mine roof.

Mine Cars, Shuttle Cars, Locomotives, Tractors, Track

American Car & Foundry Co. (1523)—Large-capacity all-steel dropbottom car; other ACF cars for mine service.

American Mine Door Co. (1010)—Improved Canton track cleaner for narrow entries, low coal, 1 tpm on dirty track; Canton automatic switchthrower.

Coal Mine Equipment Sales Co. (2410)—Rebuilt late-type locomotives.

Baker-Raulang Co.-J. H. Fletcher Co. (219)—TJCX mine tractor, trailers.

Bethlehem Steel Co. (306-14)—Heavy-duty prefabricated track, mine cars, forged mine-car wheels.

Brown-Fayro Co. (1512)—"Brownie" HS-15 hydraulic car spotter.

Connellsville Mfg. & Mine Supply Co. (931)—Coal-handling equipment, including rotary car dumpers, sheave wheels, skips, cages, feeders and related units.

Differential Steel Car Co. (906)—Mine cars and mine-car parts.

Enterprise Wheel & Car Corp.—"See something new in Booth 1622."

General Electric Co. (450)—Tracklaying shuttle car.

General Equipment & Mfg. Co. (2513)—NEW line automatic block signals, trolley contactors, electric switches and related equipment, including Gemco plug-in block signals, trolley contactor designed to prevent rebounds, and electric track switch for all sizes of turnouts—waterproof, compact, fast-acting.

Goodman Mfg. Co. (2343-2443)—NEW Goodman Type 582-42 permissible shuttle car, fixed discharge, four motors; 4-wheel drive, foot-operated hydraulic brakes; four-wheel manual steering, hydraulic booster; NO-SPIN differentials, magnetic control, automatic acceleration.

Robert Holmes & Bros. Co. (2201)—Holmes hoisting equipment, including hoists, sheaves, cages, skips, automatic skip and cage-loading and dumping devices.

Hunslet Engine Co. Ltd. (2455)—NEW 170-hp fully flameproof diesel-mechanical locomotive for Amercian mines; weight, 37,000 lb; hauling capacity, 600 tons; height, 39 in; Cummins flat diesel; also 15-hp fully-conditioned diesel-mechanical locomotive for secondary haulage in non-gassy mines; weight, 6,000 lb; hauling capacity, 65 tons; air-cooled diesel; height, 44 in.

Irwin Foundry & Mine Car Co. (1115)—8-wheel mine cars.

Jeffrey Mfg. Co. (2543-55, 2644-55)—Three sizes of shuttle cars, 13-ton mainline locomotive.

Joy Mfg. Co. (2700)—NEW diesel-electric shuttle car.

Koppers Co. (114)—Pressure-treated mine ties, pressure-treated wood.

Myers-Whaley Co.—NEW crawler-mounted transfer car for handling coal, rock or ore; 20-hp motor.

National Malleable & Steel Castings Co. (1618)—National rubber-cushioned draft gears with both Willison automatic couplers and link-and-pin bumpers; lighter version of NC-1 mine-car truck for large 8-wheeled cars; Willison automatic coupler; reduced-size Willison coupler for lower-capacity cars; knuckle-type coupler.

National Mine Service Co. (2409-15)—NEW National 10-ton Bureau-of-Mines-approved diesel locomotive.

Nolan Co. (1609-1708)—Nolan rotary car dumper, rerailers, derailers and car blocks; Nolan Porta-Feeders.

NEW—Nolan hydraulic Porta-Feeder.

Ohio Brass Co. (1613, 1700)—Automatic mine-car couplers.

Sanford-Day Iron Works—10-ton automatic dropbottom mine car for 56½-in gage, sealed doors, overlapping ends, spring-mounted, outside-bearing trucks, automatic couplers.

W. R. Stamler Co. (1605-7)—NEW Stamler hydraulic car spotter, 100% self-protection, quick-moving accessories for shuttle-car and belt-loading points.

Westinghouse Electric Corp. (L501)—15-ton gathering locomotive.

West Virginia Steel & Mfg. Co. (2316)—Mine frogs, switches, steel mine ties, switch stands and self-contained hydraulic rail bender.

Mine Conveyors and Belting

Barber-Greene Co. (1544)—B-G channel-frame mine conveyor; B-G conveyor idlers, including standard, self-aligning, rubber-impact, rubber-tire and chevron-rod self-cleaning return types; other Barber-Greene mining equipment.

Boston Woven Hose & Rubber Co. (2305-7)—Full line BWH conveyor belting.

NEW—BWH rayon conveyor belt.

Chain Belt Co. (2405-7)—Rex and Baldwin-Rex conveyor chains; Rex troughed-belt idlers.

Dodge Mfg. Corp. (921)—Dodge Taper-Lock solid-steel conveyor pulley.

E. I. du Pont de Nemours & Co., Inc. (207)—Conveyor belts reinforced with du Pont "Cordura" rayon.

Flexible Steel Lacing Co. (814)—Belt fasteners for all application.

NEW—Two belt fasteners and application tools.

Goodman Mfg. Co. (2343-2443)—Types 97, 98 and 99 Goodman belt conveyors;

belt rollers and other belt equipment.

Hamilton Rubber Mfg. Corp. (2564)—Conveyor belting, various constructions.

NEW—Rayflex conveyor belting.

Hewitt-Robins, Inc. — Belt conveyor idlers, conveyor belting, other rubber products for mining.

Jeffrey Mfg. Co. (2543-55, 2644-55)—Belt and chain conveyors.

Joy Mfg. Co. (2320-32, 2425, 2525, 2625)—Extensible belt conveyor.

NEW heavy-duty belt idlers.

Link-Belt Co. (107, 206)—Belt conveyors and idlers.

Long Super Mine Car Co. (924)—Long Piggyback and continuous mining systems, featuring PT-12 and PT-15 Piggybacks; room and gathering conveyors.

NEW – 400-RS high-capacity long-length heavy-duty room and gathering conveyor; 400-HL face conveyor for hand loading.

National Mine Service Co. (2409-15)—Hayden system of belt splicing.

Quaker Rubber Corp. (2108)—Conveyor and elevator belting.

NEW—"Mainliner" nylon-cotton high-tension belt primarily for tipples; "Loadliner" rayon-reinforced belting with high resistance to fastener pull-out; "Ebonite" belting, cotton-reinforced with special breaker strip for high flexibility, strength and impact resistance.

Raybestos-Manhattan, Inc. (2506-12)—Homocord, Ray-Man "Tension Master" and other conveyor belts.

NEW—Ray-Man "F" heavy-duty belt.

W. O. & M. W. Talcott Co. (937)—Fasteners for all belt types; Acme patch fasteners for worn or torn belts.

United States Rubber Co. (1215)—Conveyor belting and repair methods.

Pumping and Drainage

Allis-Chalmers Mfg. Co. (1520)—Pumping equipment, including 6x6 Type SF centrifugal.

American Car & Foundry Co. (1523)—ACF lubricated plug valves.

Armco Drainage & Metal Products, Inc. (236)—Culverts, drainage products.

Boston Woven Hose & Rubber Co. (2305-7)—BWH hose.

Brown-Fayro Co. (1512)—NEW Surflow foot-valve and strainer.

Carlon Products Corp.—Carlon plastic pipe and molded plastic fittings.

Chain Belt Co. (2405-7)—Rex portable centrifugal pumps.

Deming Co.—Pumping equipment, including 5x5 gathering pump with bronze water end, self-priming pump with bronze water end, and submersible deep-well pump.

Flood City Brass & Electric Co. (817)—5-in Flood City centrifugal pump.

Frontier Bronze Corp. (336)—NEW aluminum pipe couplings, wrenches.

Gorman-Rupp Co. (2609-13) – Self-priming centrifugal pumps for gathering and sump service, including engine-driven self-priming series.

Gustin-Bacon Mfg. Co. (2469)—Rolagrip pipe couplings for plain-end pipe, Gruvagrip couplings for grooved-end pipe, Gruvagrip fittings, grooving machine.

Hamilton Rubber Mfg. Corp. (2564)—NEW Revelation cord suction hose.

Johns-Manville Sales Corp. (232)—Corrosion-resisting Transite pipe.

Ohio Carbon Co. (313)—Pump seals.

Plastex Pipe & Extrusion Co. (340)—NEW Plastex yellow pipe.

Raybestos-Manhattan, Inc. (2506-12)—Ray-Man hose.

Triangle Conduit & Cable Co.—Four types of plastic pipe.

United States Rubber Co. (1215)—Uscolite pipe and fittings, hose, etc.

NEW—Uscolite valves.

Victaulic Co. of America (1420)—Victaulic pipe couplings, ¾ to 60 in; Full-Flow fittings; Vic-Groover pipe tools, ¾ through 6 in; Roust-A-Bout couplings for plain-end pipe.

NEW—Victaulic Snap-On boltless-type coupling for fast easy assembly and dismantling of lines; Victaulic plastic insert for joining flexible plastic pipe, permitting use of standard Victaulic coupling without grooving or other preparation.

Yardley Plastics Co. (941)—Plastic pipe, ¼ through 6 in.

Ventilation

American Brattice Cloth Corp. (1015)—Inflatable brattices, ventilation tubing, seven types of brattice cloth.

Bemis Bro. Bag Co. (935)—Flexipipe ventilation tubing, including rope-seam suspension; also detachable and sewed-in couplings.

Fulton Bag & Cotton Mills (940)—F.F.F.F. jute brattice cloth, Blaze Braker brattice cloth.

Jeffrey Mfg. Co. (2543-55, 2644-55)—Aerodyne mine fans; midget fans.

Joy Mfg. Co. (2320-32, 2425, 2525, 2625)—Mine fans.

Upson-Walton Co. (636)—Jute brattice cloth.

Motors and Controls, Conversion Units, Batteries

Allis-Chalmers Mfg. Co., General Machinery Div. (1520)—Motors, controls.

Bowers Battery & Sparkplug Co. (631)—Bowers mine-locomotive and shuttle-car batteries, featuring special active material, five-clad insulation.

Electric Controller & Mfg. Co. (128-30)—Line-Arc automatic reclosing sectionalizers for DC stub-end feeders; frequency relay control for reversing and nonreversing aerial tramways, AC wound-rotor motors; Tab-Weld plate resistors.

NEW—Type ZTM thermal-magnetic overload relays for protecting AC motors.

Electric Storage Battery Co. (240-42)—NEW "TH" line of Exide Ironclad batteries built to deliver 20% more capacity in the same space.

Ensign Electric & Mfg. Co. (2558-62)—AC and DC NEMA-1 and explosion-tested mine control equipment; mine power distribution boxes, dusttight and permissible; centrifugal switches for belt protection and sequence operation; Ensigneer safety control for underground belts.

NEW—Ensign-Clark Type ADJR starter, Bureau of Mines tested for two-speed conveyor-belt motor with special features; new Bulletin 1101 centrifugal switch, Bureau of Mines explosion-tested enclosure; new power-distribution equipment providing approved means of sectionalizing power cable.

Farmers Engineering & Mfg. Co. (2511)—NEW remote control and indicating systems, primarily for mine pumps.

Flood City Brass & Electric Co. (817)—Electrical switches.

General Electric Co. (319-21)—DC mine motors with BM controls; electrical equipment for preparation plants, shovels and draglines.

NEW ewf standardized mine-locomotive accelerating and braking resistors.

Goodman Mfg. Co. (2343-2443)—Controllers and safety switches.

Gould-National Batteries, Inc. (1103)—Mining batteries, component parts.

I-T-E Circuit Breaker Co. (2303)—Type KSC automatic reclosing circuit breaker and sectionalizing of underground DC power distribution.

Irwin Foundry & Mine Car Co. (1115)—Sequence control switches.

Joy Mfg. Co. (2320-32, 2425, 2525, 2625)—Electrical equipment.

Lewis Electrical Mfg. Co.—Lewis 300-kw 275-v DC mine-type selenium rectifier.

National Mine Service Co. (2409-15)—Bemeco controllers.

Ohio Brass Co. (1613, 1700)—Mine motor starters and distribution boxes.

Post-Glover Electric Co. – Transfer switches, resistors, magnetic contactor for reel motor.

Reliance Electric & Engineering Co. (1900-2001)—AC and DC motors, including designs providing doubled horsepower in the same frame dimensions.

Schroeder Bros. (2209)—Schroeder conveyor-control switches.

Syntron Co. (1414) – NEW AC-DC power-conversion unit made up of Syntron selenium-rectifier stacks.

Westinghouse Electric Corp. (1501)—300-kw portable Ignitron rectifier; 50-kw portable selenium rectifier; complete line of AC and DC mining motors and controls; Types AB and ABI breakers.

NEW—1,200-amp sectionalizing switch.

Electrical Wire, Cables, Bonds and Specialties

Anaconda Wire & Cable Co. (1002)—Mining wires and cables—trailer, shotfiring, shovel, telephone, control.

NEW—Anaconda shuttle-car cable.

Boston Woven Hose & Rubber Co. (2305-7)—Tape.

Burndy Engineering Co., Inc. (617)—Burndy solderless connectors.

Elreco Corp. (1401)—Elreco smooth-underrun frogs and splicers, J-hooks, trolley sliders, other line material.

NEW—Elreco "Double-Inverted" trolley slook and double-inverted trolley system for all rubber-tired equipment.

Ensign Electric & Mfg. Co. (2558-62)—Rail bonds, cable connectors.

Flood City Brass & Electric Co. (817)—Flood City line material.

General Electric Co. (319-21)—Wiring cable for mines.

NEW magnet wire.

Hazard Insulated Wire Works, Div. Okonite Co. (2100)—All types of electrical wires and cables; Hazaprene sheathed portable Hazacord cables.

NEW — Hazacord Hazaprene ZBF sheathed twin mining-machine cable with new "Hex-Tite" construction for longer life.

Helwig Co. (638) — Carbon brushes, carbon contacts.

NEW Multiflex brushes, neoprene pads.

Insulation and Wires, Inc.—Insulating materials; motor-maintenance equipment.

National Mine Service Co. (2409-15—Trolley-wire splicers; National "Safe-Cable" rebuilding service.

Ohio Brass Co. (1613, 1700)—Complete line O-B smooth-underrun trolley and feeder materials, current collectors and rail bonds.

Ohio Carbon Co. (313)—Carbon brushes for rotating equipment.

Oliver Iron & Steel Corp.—Pole-line hardware.

Penn Machine Co. (2615)—"Super-Weld" and "Everlast Super-Weld" bonds.

John A. Roebling's Sons Corp., subsidiary Colorado Fuel & Iron Corp.—Electrical wire and cable.

Rome Cable Corp. (1205)—Rome 60 cables, featuring shuttle-car types.

Simplex Wire & Cable Co. (1411)—Mining cables, featuring "Geared-Type" shuttle-car and mining-machine cables.

Superior Carbon Products, Inc. (919)—Carbon-graphite, electrographitic-graphite, metal-graphite and silver-graphite brushes for heavy-duty; silver-graphite and silver-alloy contacts for controls; refacing of worn-out or burned copper contacts on controller fingers with silver.

United States Rubber Co. (1215)—Full line Royal portable cords and Royal portable cables; Royal shielded portable cables; Royal welding, borehole and mine power cable; telephone cables, lamp cord, blasting wires, power and lighting wires, Uscolite cable-splice housing.

NEW—Royalastic vinyl tape.

United States Steel Corp. subsidiaries—Electrical cable.

Van Cleef Bros., Inc. (833)—Dutch Brand insulating tapes, including friction tapes, rubber insulating tape and plastic electrical tape.

NEW—Dutch Brand wire connectors, industrial sponge rubber.

Power Transmission

Aeroquip Corp. (2312-14) — Aeroquip flexible hose and self-sealing couplings for original equipment; Aeroquip flexible hose and detachable reusable fittings for users of coal-mining equipment, including a number of NEW products.

Allis-Chalmers Mfg. Co., General Machinery Div. (1520)—Texrope drives.

Boston Woven Hose & Rubber Co. (2305-7)—Belting and V-belts.

Cleveland Worm & Gear Co. (224)—Fan-cooled Speedaire reduction units.

Chain Belt Co. (2405-07)—Rex and Baldwin-Rex transmission chains.

Dodge Mfg. Corp. (921)—Theme of exhibit, "There's only one Taper-Lock"; also, Dodge Torque Arm speed reducer and Tri-Matic overload release.

NEW—Taper-Lock sprockets for roller chain, Taper-Lock V-belt sheaves, and Taper-Lock flexible and rigid couplings; also Dodge roller chain.

Link-Belt Co. (107, 206)—Chains and antifriction bearings.

Oliver Iron & Steel Corp.—Berry hydraulic pumps, fluid motors and transmissions.

Parker Appliance Co.—Tiple-lok flare and Ferulok flareless tube fittings and directional control valves for hydraulic systems.

Twin Disc Clutch Co. (1208)—Small aluminum hydraulic couplings, Model CL industrial clutch, multiple-disk clutches, engine power take-off, Hydro-Sheave hydraulic coupling for mounting on electric motors and small internal-combustion engines, Model EH industrial heavy-duty clutch, Model P air-actuated clutch.

NEW—Disconnecting hydraulic power take-off, air-actuated friction clutch, oil-actuated multiple-disk clutch.

United States Rubber Co. (1215)—Transmission belts.

S. K. Wellman Co. — All-metal Velvetouch clutch plates, facings and brake linings, including Velvetouch matched facing sets for heavy duty; also friction parts for tractors, trucks and strip-mining units.

Westinghouse Electric Corp. (1501)—Speed reducers and gearmotors.

Bearings

Ahlberg Bearing Co. (939)—Complete line ball bearings, pillow blocks.

Bearing Service Co. (309)—Ball and roller bearings, antifriction-bearing appliances.

NEW—Replacement bearings for Bird centrifugals.

Helwig Co. (638) — Carbon bearings and seals.

Link-Belt Co. (107, 206)—L-B antifriction bearings.

National Mine Service Co. (2409-15)—Ball bearings.

Ohio Carbon Co. (313)—Mechanical-carbon bearings.

SKF Industries, Inc. (830)—Complete line SKF antifriction bearings and pillow blocks, featuring SY pillow block with Fairprene seal and flingers to exclude dirt, and triple-sealing easily-assembled SAF pillow blocks.

Timken Roller Bearing Co. (900-905)—Timken bearings.

Wire Rope and Steel Products

American Chain & Cable Co., American Cable and Hazard Eire Rope Divs. (1907)—Green Strand preformed wire rope, Acco-Registered wire-rope slings.

NEW—Acco-Registered Dualoc boom assemblies for use as back stays, sway braces, boom supports and boom extenders.

Armco Drainage & Metal Products, Inc. (236)—Metal retaining walls and a complete line of steel buildings.

Broderick & Bascom Rope Co. (1201)—Yellow Strand wire rope and braided wire-rope slings.

NEW—Brodril drilling cables.

Bethlehem Steel Co. (306, 314)—Wire rope for underground and surface use.

Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div.—Wire rope.

Hendrick Mfg. Co. (1408)—Open-steel flooring.

A. Leschen & Sons Rope Co. (1804)—Hercules Red Strand wire rope, including 3-in drag rope; wire-rope slings.

Macwhyte Co. (813)—Wire rope and round and braided wire-rope slings; wire-rope machine parts with assorted fittings permanently attached.

NEW—Macwhyte slings and "Safe-Lock" wire-rope assemblies.

John A. Roebling's Sons Corp., subsidiary Colorado Fuel & Iron Corp.—Wire rope and rope slings.

Upson-Walton Co. (636)—Wire rope, rope fittings, tackle blocks.

NEW—Swing ropes for mining machines with swaged end fittings.

Union Wire Rope Corp. (1407)—"Tuffy" wire-rope products, including dragline and scraper ropes, slings, dozer ropes, choker and mining-machine ropes.

United States Steel Corp. subsidiaries—Alloy and high-strength steel; wire rope.

Lubrication

Alemite Div., Stewart-Warner Corp. (625)—Lubrication equipment, including Model 7818E Versatol pump with power-operated ram and follower; Accumeter centralized (automatic) lubrication systems; Model 6687 gun for mine cars.

Ashland Oil & Refining Co. (717)—Ashland and Valvoline lubricants.

Cities Service Petroleum, Inc.—Specially processed mining oils.

D-A Lubricant Co. (2200)—Heavy-duty oils and lubricants.

Farval Corp. (224)—Farval centralized lubrication equipment.

Gulf Oil Corp. (612)—Gulf multiuse mining-machine lubricant.

Lincoln Engineering Co. (2614)—CentrOmatic and Hydra-Luber automatic centralized lubrication systems for mining machinery; other lubricating equipment.

NEW—Balanced-power automatically controlled pump with automatic Pressure-Flo equalizer and hose assembly for dispensing materials from heavy fibrous insulating compounds to rust and corrosion preventatives, utilizing a spray head, pole gun or flow gun; also new "Man-Size" grease guns holding 21 to 32 oz.

Pure Oil Co.—High-quality mining lubricants.

Shell Oil Co. (104)—Rotella extra-heavy-duty oil, Tellus hydraulic oil,

Alvania multipurpose grease, Simnia gear lubricant, Rimula oil.

Socony-Vacuum Oil Co.—Planned lubrication, four-step preventive-maintenance plan.

Standard Oil Co. (Ind.)—Effective mining lubrication.

Standard Oil Co. (Ohio)—Mining oils and greases, diesel fuels.

Texas Co. (1801)—Texaco lubricants and engineering service.

Tide Water Associated Oil Co.—Engineered lubrication.

Trabon Engineering Corp. (912)—Fully-automatic lubrication systems for shuttle cars and loaders using the Hydra-Lube hydraulically powered pumping unit; also units for automatically lubricating crushers, shaker screens, conveyors and other preparation equipment.

NEW—Hydraulically loaded reservoir assemblies for use with Trabon Hydra-Lube pumps.

Valvoline Oil Co.—Mining lubricants.

New and Renewal Parts

Chain Belt Co. (2405-07)—Rex and Baldwin-Rex conveyor chains.

Clarkson Mfg. Co. (1623, 1712)—**NEW** Clarkson Hevi-Duty Redbird conveyor chain for most loading machines.

Flood City Brass & Electric Co. (817)—Locomotive headlights, other locomotive and machine repair parts.

Goodman Mfg. Co. (2343-2443)—Chain sections, belt rollers, wobble gears, dimpled shaker trough section, headlights and a hydraulic-brake unit.

Jeffrey Mfg. Co. (2543-55, 2644-55)—Chains and renewal parts.

Joy Mfg. Co. (2320-32, 2425, 2525, 2625)—Electrical and mechanical parts.

Kensington Steel Co. (2342)—Dragline bucket chain, loader treads and teeth, tractor rail and grousers; rivetless, wash box and refuse chain, renewable-tooth sprockets.

NEW—Dragline bucket-chain repair links; all-manganese-steel tractor rail and grouser.

Link-Belt Co. (107, 206)—Chain.

Mining Machine Parts, Inc. (1221)—Gearing, sprockets, and renewable-rim sprockets; MMP square-head-rivet crawler chains; conveyor and drive chains; clutch disks; high-torque drive shafts and axles; and other MMP improved replacement parts.

NEW—MMP square-head-rivet crawler chains for 11 BU loader.

National Electric Coil Co.—Advanced winding practices for improved coils.

National Mine Service Co. (2409-15)—Bemeco cable reels, intermediate gears, brush holders, cable guides, journal boxes, armature and field coils, Locolite sealed-beam headlights, and replacement parts for mining equipment.

Penn Machine Co. (2615)—High-quality replacement parts for mine locomotives, mining machines, loading machines and continuous-mining equipment.

Schroeder Bros. (2209) Schroeder locomotive headlights.

Tool Steel Gear & Pinion Co. (200)—Hardened gears, pinions, sprockets, sheave wheels, shafts and other gearing and shafts.

Bertrand P. Tracy Co.—Gears, pinions, other repair parts.

West Virginia Armature Co. (632-34)—Armature and field coils for all mining equipment; locomotive journal and axle linings and other replacement parts.

Wilmot Engineering Co.—Keystone rivetless-chain conveyors in drop-forged steel, alloy or cast chrome-manganese.

Maintenance

American Brake Shoe Co., American Manganese Steel Div.—Castings of "the toughest steel known," including cable-saving sheave; hardfacing applications, including Wearsharp dipper-tooth pointers.

Blackhawk Mfg. Co. (825)—Hydraulic hand jacks to 100 tons; hydraulic service jacks to 4 tons; hydraulic Porto-Power equipment.

NEW—Line of hand service tools.

Coffing Hoist Co.—Safety-pull ratchet lever hoists, Hoist-All, Mighty Midget puller, coil-chain safety-pull ratchet-lever hoist, Quik-Lift electric hoists, Challenger spur-geared hoists.

Duff-Norton Mfg. Co. (1901)—Complete line hydraulic, ratchet and screw jacks, featuring 5- and 10-ton ratchet jacks.

Johns-Manville Sales Co. (232)—Packing and gaskets; heavy-duty asbestos friction materials.

Martindale Electric Co. (613)—Commutator and electrical maintenance and repair equipment, electrical testing instruments, metal-marking equipment, four sizes of portable electric blowers, all convertible to vacuum cleaners.

NEW — Chain-drive commutator grinder; Model HV-3 bench-type commutator undercutter; Type C Comstone holder; Martindale V.A.O. tester; Model 153 growler aid; Model D-3 demagnetizer.

Rust-Oleun Corp. — Rust-preventive coatings.

Star Jack Co.—Standard line of industrial jacks, including new items.

Syntron Co. (1414)—Portable power tools, mechanical shaft seals.

Templeton, Kenly & Co. (821)—Ratchet lowering jacks; push-and-pull jacks, including Util-A-Tool maintenance set; anchor jacks, screw jacks, journal jacks, track or trip jacks, and three types of hydraulic jacks—standard, center-hole hydraulic pullers, remotely-controlled rams and pumps.

NEW—10-ton ratchet lowering jack with aluminum housing.

United States Rubber Co. (1215)—Royal Guard protective coating.

Valvoline Oil Co.—**NEW** Polar-type rust-preventive coatings.

Preparation

Allis-Chalmers Mfg. Co., General Machinery Div. (1520)—"Low-Head" screens, "Ripl-Flo" screen with "Thermo-Deck" heating unit; solids-handling pumps.

American Air Filter Co., Inc. (1548)—Type N Roto-Clone dust collector, electrostatic type, dust separated by water curtain; Type W Roto-Clone combined exhauster and dust collector, dust removal by water-covered impeller.

American Wheelabrator & Equipment Corp. (2300-01)—No. 5 Model 112 Dustube cloth-tube-type dust collector with rotary valve, screw conveyor and synthetic-fiber cloth for high-temperature applications, such as flash drying.

Armco Drainage & Metal Products, Inc. (236)—Multi-Plate storage and surge bins.

Ashland Oil & Refining Co. (717)—Ashland coal-spray oils.

Bird Machine Co. (228)—The Bird filter for dewatering fine coal.

NEW—Bird "Polisher"—continuous centrifugal filter to clean up water for continuous recirculation. Used with simple flocculation system, the unit solves the problems of stream pollution and sludge-pond maintenance.

Bixby-Zimmer Engineering Co. (607)—Bixby-Zimmer round-rod all-welded stainless-steel screens.

Brown-Fayro Co. (1512)—High-pressure "Cold Oil" spray outfit for dust-proofing and freezeproofing coal.

Calcium Chloride Institute (134)—Calcium-chloride uses in coal mining and preparation.

Carboloy Dept., General Electric Co. (1647)—Carboloy permanent magnets.

Centrifugal & Mechanical Industries, Inc. (100)—Model E C-M-I continuous centrifugal drier and component parts.

Coal & Mineral Washer Corp. (1606)—Nichols Freeman Vortrap, Pettibone Mulliken slurry pump, literature on Bulkley Dunton Colloidaire clarification.

Colorado Fuel & Iron Corp., Wickwire Spencer Steel Div.—Coal screens.

Combustion Engineering—Superheater, Inc., Flash Dryer Div. (116-18)—C-E Raymond flash-drying system for coal.

Nelson L. Davis Co. (2565-69, 2669)—Neldco two-stage dense-media coal-cleaning plant producing intermediate product for further treatment; also standard coal-cleaning plants, 20 to 350 tph, and custom-built plants.

Deister Concentrator Co. (1805)—SuperDuty Diagonal-Deck coal-washing table; Concenco antifriction-bearing head motion; Concenco 108 distributor; and Concenco J-132 and J-136 spray nozzles.

NEW—Leahy vibrating screen with FlexElex cloth-heating unit.

Deister Machine Co. (2554)—Improved coal-washing table with lifetime antifriction-bearing head motion.

Denver Equipment Co. (1600)—Complete coal-flotation plant.

Dings Magnetic Separator Co.—RM rectangular suspended magnet; other magnetic equipment.

Dorr Co. (333)—**NEW** Dorrclone for recovering coal fines with special lining to solve the wear problem.

Fairmont Machinery Co. (1519)—Coal-preparation services.

T. J. Gundlach Machine Co.—**NEW** two-stage crusher, 6 in down to ⅝ in;

sizes 18, 27, 36, 56 in; capacities, 60-80, 90-125, 150-200, 250-300 tph; also 9-, 18-, 27-, 36-in single-stage crushers, 25-30, 60-80, 90-125, 150-200 tps.

F. B. Hannon & Sons—Two Hanco electric screen heaters with ground-detecting lights and tap-changing devices.

Hendrick Mfg. Co. (1408)—Complete line of late-type screens, including round and square perforated flat screens and flanged lip screens.

NEW—10-A, 15-A Wedge Slot screens.

Hewitt-Robins, Inc. — Gyrex screen with Hewitt-Robins Hannon cloth heater; full-size shuttle conveyor; screen cloth.

Heyl & Patterson, Inc. (1529)—Standard 8- and 14-in Cyclone thickeners; Reineveld centrifugal coal drier.

NEW—H & P 8-in Cyclone with water-injection for high efficiency.

Robert Holmes & Bros., Inc. (2201)—Holmes lowering spirals; Holmes Baughman Verti-Vane thermal drier for 1½-in and smaller coal; Holmes railroad-car-handling equipment; Holmes laboratory crushers and pulverizers.

Interstate Equipment Div., Yara Engineering Corp. (120)—Conveying-type tramways up to 500 tph capacity; self-dumping reversible tramways.

Jeffrey Mfg. Co. (2543-55, 2644-55)—Double-roll crushers, vibrating conveyors and feeders.

Kanawha Mfg. Co. (124)—Coal preparation plants.

Link-Belt Co. (107, 206)—Multi-Louvre drier; Link-Belt heavy-media float-sink concentrator; "CA" concentric-action vibrating screen with heated screen cloth.

Ludlow-Saylor Wire Cloth Co. (831)—Wire cloth, wire filter cloth and square- and long-opening woven-wire screens, including abrasion-resistant square-opening screens woven of 1-in Super-Loy bars; also fine-mesh wire cloth with hook-stripped edges for easy application to tensioned screens, and coarser meshes with hooked edges for supporting and protecting fine-mesh screens; various types of hook strips.

McLanahan & Stone Corp. (2204)—Coal crushers.

McNally Pittsburg Mfg. Corp. (1016)—Main and divisional offices established for discussion of all problems in coal cleaning, screening, centrifuging and general preparation.

Morris Machine Works (929)—2-in Type R slurry pump featuring ease of dismantling and accessibility; also Morris abrasive-handling pumps.

Oliver United Filters, Inc. — Oliver horizontal and American disk filters; also Olivite acid-handling and ODS slurry pumps.

Pennsylvania Crusher Co. (2254)—Bradford breakers, Bradford hammermills, Granulators, single-roll crushers, and one-way and reversible hammermills, featuring the peripheral-feed Bradford hammermill for large-coal coal preparation; also jaw and Gyracone crushers, Impactors, Dixie Non-Clog hammermills.

Productive Equipment Corp. (1903)—Gyroset vibrating screen, which can be equipped with electrically heated screen cloth; L & L cleaner readily installed on any standard unit to eliminate binding caused by near-size plugging.

Roberts & Schaefer Co. (2000)—Coal-processing plants and equipment.

Shell Oil Co. (104)—Limea and Carnea coal-spray oils.

Simplicity Engineering Co.—Model OA-10-JA single-deck horizontal Simplicity D'Watering screen; Model M-9 double-deck Simplicity Simpli-Flo inclined-type two-bearing screen.

Solvay Process Div., Allied Chemical & Dye Corp. (917)—Calcium chloride for freezeproofing and dustproofing.

Stearns Magnetic, Inc. (1209)—36 x 36-in rectangular suspension magnet, 24 x 24-in permanent magnetic pulley.

Syntron Co. (1414)—Vibrating grizzlies, screens and picking tables, bin vibrators, test-sieve shakers.

NEW—Line of long shaker conveyors.

W. S. Tyler Co.—NEW Ty-Rock vibrating screen; Ro-Tap testing-sieve shakers, Tyler standard-screen-scale testing sieves, and woven-wire screens.

United Engineers & Constructors, Inc.—Preparation services.

United States Steel Corp. subsidiaries — Stainless steel for preparation-plant service.

Water Neutralizing Co. (2306)—**NEW** Wanuco water-neutralizing unit for preparation plants.

Wedge Wire Corp. — Wedge Wire screens in various styles, featuring a screen constructed with curved wire.

Western Machinery Co.—Wemco drum separator for heavy-media separation; 44-in Wemco Fagregren flotation machine.

NEW—Wemco solids pump.

Wilmot Engineering Co.—Hydrotator, Hydrotator-classifiers, heavy-media and froth-flotation systems, jigs and Hydro-separators.

Safety and Communication

American Mine Door Co. (1010)—Midget rock duster.

Farmers Engineering & Mfg. Co. (2511)—Trolleyphone equipment for mines, Audiophone for voice amplification primarily at preparation plants.

NEW—Pagephone for intercommunication between wired stations.

J. H. Fletcher & Co.—Baker-Raulang Co. (219)—Rubber-tired mine trikes.

General Electric Co. (319-21)—Complete line mine-communication equipment.

Irwin Foundry & Mine Car Co. (1115)—Mine passenger cars.

Johns-Manville Sales Corp. (232)—Corrugated and flat Transite for fire barriers.

Mine Safety Appliances Co. (1009)—MSA MinePhone; Edison R-4 cap lamps; MSA Bantam rock duster; and a complete line of safety equipment.

NEW—MSA HoistPhone permitting communication between hoisting engineer and cage at all times.

National Mine Service Co. (2409-15)—Wheat electric cap lamps with automatic charging and electronically controlled voltage regulation; Koehler flame safety lamps in steel and aluminum.

Protectoseal Co. (642)—Fire-prevention equipment for the safe handling, storing and dispensing of flammable liquids, featuring nonexplosive safety cans, oil-waste cans, cans for washing and cleaning in shops, drum fittings for safe dispensing of flammable liquids, safety hand transfer pumps, flame-arrester vents for storage tanks, pipe-line arresters, fuel-tank safety fill caps for portable gasoline—and diesel-powered equipment, and other safety containers, fittings and devices.

Raybestos-Manhattan, Inc. (2506-12)—Safety trolley-wire guard.

NEW—Improved Buronik trolley-wire guard.

Safety First Supply Co. (1800)—Scott Air-Pak self-contained breathing apparatus; other safety equipment.

NEW — Fiberglas safety cap—lighter in weight, more air space and greater resistance to impact.

United States Rubber Co. (1215)—Trolley-guard rubber, Uskon floor mats.

Mining Specialties and Services

Bituminous Coal Institute, Inc.—Public-relations and merchandising services of the National Coal Association.

Coal Age (1220) — Modern methods service in mining, preparation and safety; Coal Mine Directory; Keystone Coal Buyers' Manual.

Johns-Manville Sales Corp. (232)—Corrugated and flat Transite for tipples and other structures.

Manu-Mine Research & Development Corp.—Soil solidification and other mining developments.

Mechanization, Inc.—Mining and utilization services.

Mining Congress Journal — Coal and metal-mining services.

Tamping Bag Co. (1019)—Brush and weed-control chemicals for right-of-way spraying and general weed control.

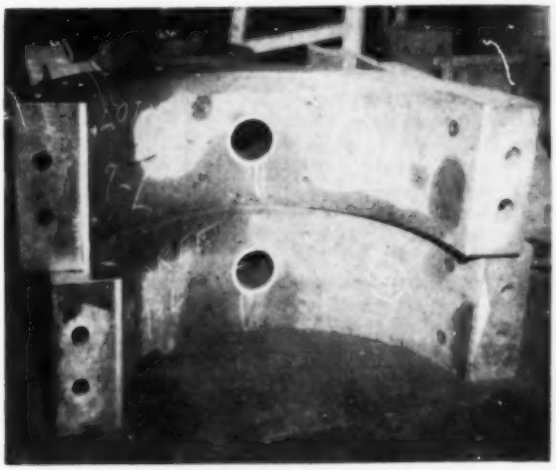
Toledo Porcelain Enamel Products Co.—V-Corr roofing, siding, flashing.

U. S. Bureau of Mines—Safety service, coal research.

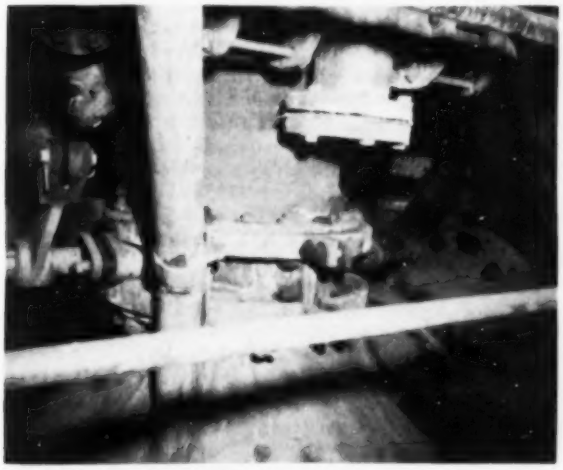
The following companies also will be represented at the exposition but either planned no specific product displays or details of their displays were not available at the time this summary was prepared:

American Mine Supply Co.
American Pulverizer Co.
Browning Dust Collector.
Foote Bros. Gear & Machine Co.
Fuel Process Co.
General Cable Co.
B. F. Goodrich Co.
Goodyear Tire & Rubber Co.
Jones & Laughlin Steel Co.
Kanawha Mfg. Co.
Knapp Mills
Rydin Ry. Equipment Co.
Watt Car & Wheel Co.
Wedge Bar Screen Corp.

BUTTERFLY GATES, here midway in rebuilding process, are enclosed in these rebuilt . . .



CAST-IRON, STEEL-LINED GATE CHESTS to make a relatively inexpensive . . .



REFUSE CONTROL above and below the refuse chambers of large sand-flotation cones.

A switch to butterfly-type gates leads to . . .

Efficient Refuse Ejection

How Hudson Coal Co. streamlined the removal of refuse from sand-flotation cones by replacing flat slide gates with butterfly gates.

How a well-planned reclamation procedure reduces costs further by promoting economical rebuilding of worn gates for more service.

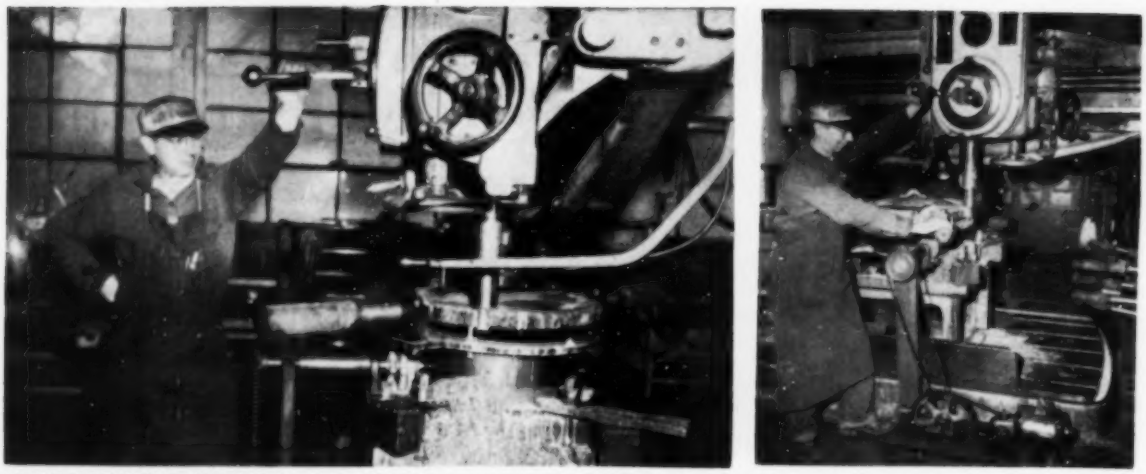
WITH THE SEARCH for cost-cutting ideas gaining momentum, here is an idea which The Hudson Coal Co., Scranton, Pa., lays on the table for your examination and consideration. It contains designs and methods for streamlining refuse-ejection from eleven 15-ft sand-flotation cones in four of the company's five large cleaning plants. Fully developed, the Hudson Coal idea involves (1) the substitution of butterfly gates above and below the refuse chambers of the cones in place of the slide gates formerly used and (2) the repair of these butterfly gates and gate chests in the Providence repair shops operated by Hudson.

As expressed by operating officials, the benefits derived from the application of this idea are (1) positive, trouble-free operation, (2) lower first cost and substantially lower maintenance costs and (3) easier replacement of worn-out gates.

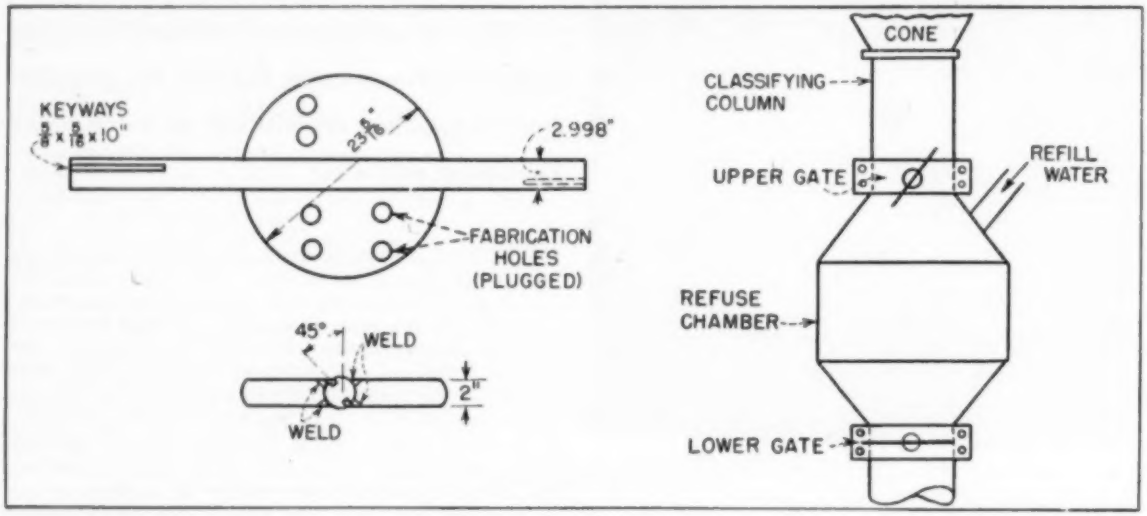
Two of the butterfly gates are used with each cone, at the top and bottom of the refuse chamber, as mentioned. Each gate consists of two steel circular segments, 2 in in thickness, welded to a shaft, as shown in the illustration. The complete assembly also includes a circular cast-iron and steel chest in which the gate operates.

As refuse drops through the sand-and-water suspension in the cone it collects above the top gate. When a predetermined amount of refuse has been thus collected, the top gate is opened and the refuse drops into the water-filled refuse chamber. Then the top gate is closed, the bottom gate is opened and the refuse drops out of the chamber into the refuse-handling units of the plant. The bottom gate takes the greater beating since it receives the refuse in surges as the top gate is opened.

Formerly, the refuse gates were made of long steel plates pierced at one end with a hole of the same diameter as that of the refuse-chamber opening. Such a gate is closed when the solid portion of the steel plate covers the



SHOP-MADE TURNTABLE for use with drill press is equipped with set screws for tilting butterfly to expose edges for beveling. Turntable power train (right) includes salvaged parts from a cutting machine and locomotive reel motor and is driven by a domestic-stoker motor.



LOWER INITIAL COST, less maintenance and reduced down-time are benefits of the change to butterfly gates.

refuse-chamber opening, and open when the pierced portion of the plate is presented to the opening. In few words, the former gates on the big cones were steam-driven slide gates. Ten 7-ft cones and one 15-ft cone in the company's plants still are equipped with this kind of gate.

The adoption of butterfly gates as standard equipment for the big cones was a result of Hudson's policy of investigating all items in the cleaning plants which require frequent replacement or repair. Previously, this policy had led to the substitution of rubber pipe for metal and to the replacement of metal valves with pinch valves on rubber-pipe sections in many cleaning-plant applications.

The slide gates were a source of irritation in view of their penchant for clogging up with sand and occasionally freezing up in cold weather. The first attempt to solve the problem consisted of providing four auxiliary water inlets around each of the slide gates to keep them free of lodging sand. But these inlets required additional attention as a result of blockage and in time became another item needing periodic replacement. They are not required with butterfly gates.

The butterfly gates finally were selected as the best solution to the problem. As proven by several years' experience, they have made a definite contribution to increased cleaning efficiency. At the time the gates were placed in service, it was estimated that the initial cost of the complete butterfly-and-chest assembly was about 75% of the initial cost of a slide gate. Labor cost for replacing a worn butterfly and chest with a new one is about ⅓ of the labor cost of replacing a slide gate.

These earlier investigations were headed by J. S. Johnson, superintendent of construction and maintenance, and J. F. McLaughlin, superintendent of preparation.

How Development Proceeded

That's a short review of how and why The Hudson Coal Co. made these changes. But it isn't the whole story because research and development on the company level are continuous functions.

The scene shifts to the Providence repair shops, where D. N. Smith, shop superintendent, gives higher polish to the whole idea by setting up a reclamation procedure for

returning worn-out gates and chests to workable condition. Thus, the favorable costs resulting from the change to butterfly gates was further improved through refined fabrication and repair activities in the shop.

It became apparent shortly after the new-type gates were adopted that the cost of producing a new one to replace each worn-out one was unnecessarily high. Men and machines were pinned down for lengthy periods in the meticulous work of cutting the circular segments and welding them to the shafts. Each blank, from which a segment was to be made, had to be drilled with four holes to make it possible to fasten the blank in a jig for cutting a close-tolerance circular arc. Furthermore, the circular edge required final machining, the four holes had to be plugged by welding and the two segments had to be welded to the shaft. This expenditure of time and materials could be materially reduced, Mr. Smith figured, if the worn assemblies could be economically rebuilt.

As always, when a new shop process is under consideration, Mr. Smith investigated the possibility of rebuilding the assemblies, with special emphasis on costs and shop procedure. A workable solution was the result, even though it required the design of a new attachment for a milling machine, as explained later in this article.

At the outset, an inventory of spare gate-and-chest assemblies was made up to provide for necessary replacements and to make it possible to stock enough worn-out assemblies to justify setting up the machines and scheduling the men for a worthwhile reclamation run. A reclamation run usually is scheduled when a number of worn assemblies in the shop approaches a dozen, say.

Take the butterfly gate, itself. The worn edges of the circular segments are built up with welding rod to the original diameter. The portions of the shaft which rest in the bushings in the chest are built up in like manner. The built-up sections of the shaft are machined down to their original diameter of 2.998 in and the built-up edges of the segments are milled to provide the 23$^{15}/_{16}$-in diameter of the butterfly.

The milling is done in a 5-ft Fosdick drill press fitted with an end-milling tool. This particular press is hydraulically stabilized, thus eliminating tool chatter or vibration which would foul up the circular outline of the butterfly.

The turntable, which holds the butterfly for milling, is a creation of Mr. Smith and the machinists. The worm and drive pinion are salvaged parts from the Jeffrey 24B cutting machine, the gearing is taken from a CY-21 locomotive reel motor and the turntable drive unit is a ¼-hp motor formerly used on a domestic stoker.

The upper head of the turntable is equipped with a number of set screws which are raised or lowered as necessary to expose the upper and lower edges of the circular segments to the milling cutter. These edges must be beveled to permit the butterfly gate to rotate within the close confines of the chest.

The chests also are rebuilt at the shop, and only complete, tested assemblies, each consisting of a gate and a chest, are shipped to the cleaning plants.

A chest consists of two semicircular castings which are bolted together around the butterfly for insertion into the cone. Liner plates for the chests are made of ⅜-in. rolled steel plate. They are secured to the castings by countersunk Allen-head bolts. Chest reclamation also includes replacement of the bronze bushings for the butterfly shaft and repair of the packing glands.

In commenting on the materials used, Mr. Smith points out that both the welding rod which is used for building up the butterfly and shaft and the liner plates are made of soft steel to facilitate machining. The specified rod is ASTM-E6010.

The castings from which the chests are assembled also are an improvement over previous practice. Formerly, the split sections were fabricated by welding steel flanges and reinforcing ribs to curved steel plates. But casting the sections in the company's own foundry at Providence is less expensive, and the increased brittleness of the castings is not a major drawback in view of the strengthening provided by the steel liners.

In the field, cleaning-plant officials agree that the changes have contributed to better plant performance. At Olyphant colliery, J. G. Houlihan, outside foreman, points out that down-time resulting from sluggish gate operation has been practically eliminated. This has been accomplished through the use of butterfly gates in spite of the fact that Olyphant's 15-ft cone traps out refuse at a top rate of 125 tph. In this rugged service, a top gate lasts about a year and a bottom gate about 6 mo.

The butterfly gates are steam-powered, and a rubber-pipe pinch valve, which controls the flow of refill water to the refuse chamber, is interlocked with the bottom gate.

Capsule Economics

FREE ENTERPRISE: You furnish your own ladder and the government merely stands by to steady it as you climb.

SOCIALISM: The government furnishes you a ladder for free, but no rungs.

COMMUNISM: The comrades, finding you already well up the ladder, jerk it out from under you, break it up and beat you to death with the pieces.

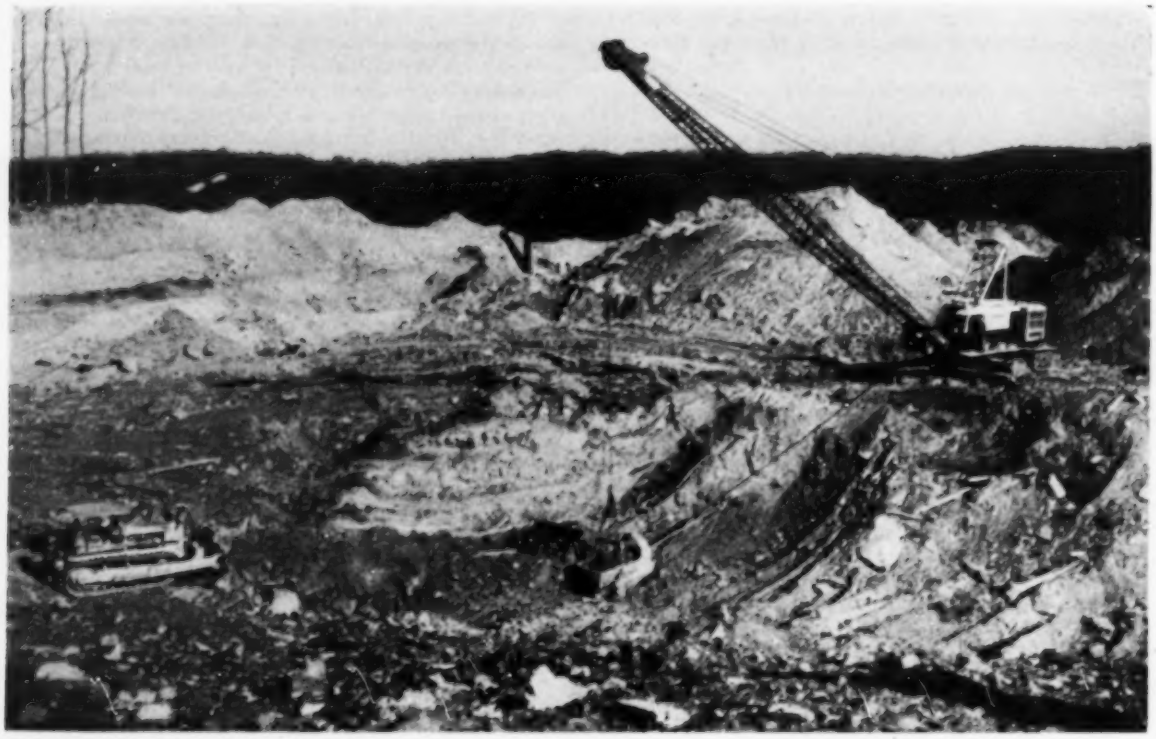
—Pathfinder

Mother to Son

IN THIS WORLD you will have to make your own way. To do that you must have friends. You can make friends by being honest, and you can keep them by being steadfast. You must keep in mind that friends worth having will, in the long run, expect as much from you as they give to you. To forget an obligation or be ungrateful for a kindness is a base crime—not merely a fault or a sin, but an actual crime. Men guilty of it must sooner or later suffer the penalty.

IN PERSONAL CONDUCT be always polite, but never obsequious. No one will respect you more than you esteem yourself. Avoid quarrels as long as you can without yielding to imposition. But sustain your manhood always. Never bring a suit at law for assault and battery or for defamation. The law affords no remedy for such outrages that can satisfy the feelings of a true man. Never wound the feelings of others. Never brook wanton outrage upon your own feelings. If ever you have to vindicate your feelings or defend your honor, do it calmly. If angry at first, wait till your wrath cools before you proceed.

—From the last letter of his mother to Andrew Jackson.



DRAGLINE ONE OF THREE UNITS stripping cover up to 60 ft, 5-yd dragline works from bench to excavate down to the coal, assisted by a bulldozer for clean-up.

Stripping Hilltop Coal

Stripping of hilltop areas in southern tip of Ohio expanded in 3 yr with addition of new equipment. Company supplements truck haulage to industrial customers with newly completed loading dock on Ohio River.

BUCKEYE STRIPPING is 4 mi north of Hanging Rock, in southern Ohio.

PRODUCTION of 600 tpd—for an estimated output of 100,000 tons in 1953—from hilltop areas in the southernmost part of Ohio is expected at a new strip mine operated by the Buckeye Coal & Limestone Co., Ironton, Ohio. Originally organized in 1942 to carry on underground mining about 20 mi north of Ironton, the company ceased deep mining after the war and in 1950 opened a strip operation 4 mi north of Hanging Rock, Ohio.

Stripping operations, which were started in a small way in 1950, have since been expanded with acquisition of new equipment. Now the firm, which is a partnership of O. C. and C. E. Collins, has 3,000 acres of Ohio No. 5 seam coal in the general vicinity of Hanging Rock, in Lawrence County, which is the southern tip of the state. Coal in this area has become of greater importance in the last few years as a result of the Ohio Valley industrial expansion.

The seam being mined ranges from 30 to 40 in thick, including a 2- to 4-in dirt band occurring continuously 6 to 10 in from the bottom. The coal lies in the hilltops under 30 to 80 ft of cover ranging in character from hard sand rock to laminations of sand rock and shale. Normal depth to which stripping is carried on is 60 ft. Vertical drilling is used except where there is a vein of shale 3 to 4 ft above the coal, in which case horizontal drilling is done.

Methods at the mine are indicated to a considerable extent by a study of the following equipment now in use:

Stripping Shovels: one Lima 1201 with 2½-yd Amsco bucket; and one Lima 1201 with 2½-yd Esco bucket.

Dragline for Stripping: one Marion 111 with 5-yd Hendrix bucket.

Bulldozers: two D8 Caterpillar; and two TD24 International.

Graders: one 112 Caterpillar.

SHOVELS **TWO 2½-YD SHOVELS,** helped by bulldozers, handle part of stripping and also prepare bench for dragline. Bulldozer in right photo is moving spoil cast by shovel.

DRILLING **ONE DRILLING CREW** alternates between vertical unit (left) and horizontal drill, which can be used where holes can be placed in fairly soft strata.

LOADING **COAL IS LOADED** without shooting down to a 4-in parting 6 in from the bottom with this 1½-yd shovel equipped with a special loading bucket. Last 6 in of coal is hand-loaded into elevator (right).

HAULAGE **ONE OF FLEET** of 10 trucks dumps its 9-ton load at tipple after 4-mi haul from pit. Five men pick coal on an elevating belt. Grader in pit (right) cleans coal before loading and also builds roads and levels spoil.

RIVER DOCK **BARGES** are loaded at new river dock, shown at left under construction, to economically supply power plant customers. Office, scale house and tipple are 600 ft from river. Truck shop is at left, back of trees

KEY MEN **C. E. COLLINS** (left) and O. C. Collins, partners in the company. Right photo: Standing—Donald Shepard (left), oiler; O. C. Collins, partner, with his son, Clark; Virgil Richards, shovel operator; and T. Ferrell, pit superintendent. Kneeling—Lloyd Ruth (left) and Rhuben Bradshaw, repairmen.

Loading Shovel: one P&H with 1½-yd P&H bucket.

Drills for Overburden: one McCarthy horizontal; and one McCarthy vertical, mounted on a General Motors truck.

Portable Conveyors: two Baughman.

Coal Trucks: 10 "Big-Job F8" Ford with end-dumping bodies.

Although the company bought some used equipment to start operations, inefficient units have been since replaced with new machines.

Operating methods are typical of small-tract hillside strippings. For dragline work, bulldozers prepare a bench from which the dragline excavates down to the coal, assisted by a bulldozer to handle the clean-up. Where shovels are used and the casting distance is limited, bulldozers assist the shovels by pushing and leveling the spoil. Work in the various pits is planned so that coal will be loaded from the areas with good drainage during winter months and from lower areas in the summer.

Coal is loaded without shooting, the shovel taking the seam down to the dirt band. After buildozers have scraped off the 2 to 4 in of dirt, the 6 to 10 in of bottom coal is hand-loaded into Baughman portable conveyors elevating into trucks. Stripping is done on three shifts, with coal loaded on one shift.

Coal is hauled 4 mi in Ford "Big-Job F8" trucks (average loading, 9 tons) and dumped at the tipple, which is on U. S. 52 at Hanging Rock about 600 ft from the Ohio River. Although it is near the N&W tracks, the tipple has no railroad facilities. Equipment includes an elevating belt conveyor on which the coal is picked, a crusher, shaking screen and several storage bins. Since 95% of the mine output goes to industrial firms, most of the product is crushed. The other 5% is sold at the tipple to truckers.

The company recently completed a dock for loading barges, and a considerable tonnage now goes by river to power plants along the Ohio. Coal is hauled the 600 ft from the tipple to the river by truck through an underpass that takes Route 52 across the N&W tracks.

Using its own trucks, the coal company delivers a considerable tonnage to local Ohio industries, such as the Solvay Process Co., at So. Point (14 mi), the Alpha Portland Cement Co., Ironton (6 mi), and the Superior Cement Co., Superior (19 mi).

The Buckeye Coal & Limestone Co. has 75 employees, including truck drivers, timber and sawmill crews. It is in the lumber business only to the extent of salvaging and marketing timber ahead of the stripping operations.

O. C. Collins, who serves as operating manager for the company, is a former teacher and county superintendent and now is in his second term as Ohio state senator.

The Origin and Growth of Sprags

By THOMAS ALLEN, Chief Coal Mine Inspector, State of Colorado

THE SPRAG has had a long history in coal mining, though at times it would seem that this question is in order: "Is this sprag necessary?" It is a simple device, being merely a short piece of wood, or iron, or pipe inserted between the spokes of a wheel to slow down or stop the car.

The origin of the sprag has been clouded in obscurity—that is, until recent years, when archaeologists in western America discovered the fossil remains of prehistoric animals, called dinosaurs, which roamed the forest during the coal-formation period.

The enormous size of some of these animals and the ferocity of certain types undoubtedly gave prehistoric men some problems. The question is: "What did these men do when they had to deal with these animals, either accidentally or on purpose?" The answer was found in the discovery of short poles in the vicinity of the remains of the dinosaurs uncovered.

These short poles could not have been used for any other purpose than tripping up said dinosaur in pursuit of his probable prey, which of course would be some hardy soul and fast runner acting as a decoy. It is easy to envision his buddies placing themselves in ambush, and then, as the animal panted after what he expected would be his dinner, throwing the pole between his legs and tripping him—in other words, applying the sprag. Then the old boys would pile on and administer the coup de grace with stone clubs and axes.

This can be accepted as the truth, because otherwise there seems no way that men armed only with stones, clubs and sticks could tackle a desperate problem like the extinction of an animal 90 ft long and weighing tons. From the depth of the footprints found in mining operations, it looks like the human being encouraged the animal to get into high gear and travel at full speed before the spragging was attempted. The reason was that the faster the brute was going the more likely he was to break his neck when he crashed, thus giving his captors more of an advantage. There are many places in our Colorado coal-mining districts where the remains of these animals are found, along with the remains of trees, poles, etc., all proving the triumph of mind over matter when primitive man matched wits with the dinosaur—object, removal of a hazard or a steak for dinner.

Happening, as it did, in the coal-mining areas, it stands to reason that this procedure should serve as a precedent for present-day methods of overcoming the momentum of a large body in motion—the mine car. And it might be said that the practice still is accompanied by its hazards, though they are somewhat different in nature. Instead of the animal getting the entire man, the wheel gets a finger or an arm.

The continuous use of sprags in coal mines for stopping the rotation of a wheel and making it slide of course causes flat places on the wheel tread. For this reason, it may be stated that coal mining is the only industry where the hexagon or the octagon is preferred over the circle as a wheel shape.

Moral—Sprags are only one of the hazards involved in transportation, now moving more and more to the forefront as the source of injuries and fatalities. The answers are good equipment, good haulageways, proper controls and trained, responsible men in the mines.

The Todhunter Story:

"My 66 Years in Deep Mining"

***"Always it's been improvements, improvements, improvements"*—R. T. Todhunter Sr., president, Barnes & Tucker Co.**

RICHARD T. TODHUNTER SR., president of Barnes & Tucker Co., Barnesboro, Pa., started mining coal when he was 12 yr old. That was over 65 yr ago. As far as COAL AGE knows, that's a longer span than any other top coal executive, still active, can lay claim to.

A pair of COAL AGE editors went to Barnesboro to see Mr. Todhunter this spring. They wanted him to talk about his life in mining and the changes he has been a part of and, with the perspective that comes from long experience and success, to look ahead to the years yet to come.

An erect man—medium height, comfortable weight, no paunch—strode quickly and with sure step to meet the editors at the office door. That was Mr. Todhunter. He led them inside a simply furnished office—a wide mahogany desk, clearly the working place of a busy but orderly man; beyond that, a swivel chair, leather-upholstered; overhead, on the wall behind the desk, a "Certificate of Cooperation" citing Barnes & Tucker for work in World War II, together with framed photographs of old mine buildings and associates of past years; to the right, olive-green file cabinets and a coat-tree; to the left, a lavatory and mirror, a hanging towel and drinking cups; and resting on head-high shelves, a handsome gold clock and an equally handsome combination barometer-thermometer-hygrometer, both gifts from long-time associates in the company and friends.

Light streamed through two windows, one facing south, the other west.

Mr. Todhunter talked fluently and easily, gesturing freely with his hands and grasping a filter-type cigarette holder between two fingers. Now and then, to drive home a point, he brought his fist down firmly on the desk or shook a finger. More often, he smiled.

Mr. Todhunter, it was plain to see, was relaxed and confident, like an athlete. In fact, at 77 he still looks—and is—an athlete. He plays golf with the best of them, hunts with the best of them, and catches more fish than anybody else.

Here's what Mr. Todhunter told COAL AGE editors . . .

COAL AGE: Mr. Todhunter, as far as we know, you're just about the granddaddy executive in the coal-mining industry. Will you take us back to the beginning and tell us how you got started in coal?

MR. TODHUNTER: Yes, I'd like to.

I was born in Northumberland, England, in 1876 and brought to this country in 1881. My father had come ahead of us—my mother, my brother and me—and worked in the anthracite. We came to Houtzdale. My mother died about a year after that and from then on we batched, the three of us. My sister was adopted by Mr. & Mrs. Rocket. We lived in five or six mining towns here in Central Pennsylvania. It was pretty tough living those years.

CA: What was your first job in the mines?

MR. TODHUNTER: I first went to trapping—in 1888, about February, I started. I was 12 in August. I was working about 6 mo and got my leg hurt. Tell you how. That's something funny. We were using oil lamps at that

"Coal mines are full of troubles. You've got to be able to beat them out."

"If you're a mining man, you've got to be thinking about it all the time."

time—lard oil. "Sunshine," as they called it, came after that. It was a little purer than lard oil. To get some oil to keep my lamp going, I was trying to pump a wheel to get some blackstrap out of it. I dropped one car down and didn't put the brake on the back one and it came down against my leg. I was hurt for a considerable length of time. I was operated on—the bone scraped and the leg fixed up by an old Army doctor.

. . . After that, I went to work with my father. He was pulling pillars in old Atlantic No. 1. In that mine, they had an endless rope. They pulled the coal out in trips—about 2-ton cars. The coal was anywhere from 5 to 6 ft high—Moshannon coal. We had a little water in the place and I can remember having a hand pump. But they were wonderful conditions there, yes.

CA: You spent a while down in West Virginia, too, didn't you?

MR. TODHUNTER: I went down in West Virginia, I'd say, the latter part of 1896. I was down there a little better than 2 yr. I went to Edgewater, above Montgomery about a mile and a half, and there I worked with a good old colored fellow in the pit, and I liked him. But work got bad and we—my brother and I—moved to Mt. Carbon above Eagle. My daddy came down to West Virginia after I did. I worked at Black Diamond and lived at Mt. Carbon for a while—that's where they took all your coal below ½ in and put it in the railroad car and didn't pay you for it. And from there we went up on New River, shortly before they put the railroad bridge across New River up Lupe Creek. We worked at a place called Clairmont. That was nice coal—red ash.

CA: What did you do down in West Virginia?

MR. TODHUNTER: I drove mules sometimes—night shift with a mule and water car. Sometimes I had to bail water out of holes into a water car. As the headings were driven up, you see, the water would flow down to the face and into a little sump or local dips there. That's how we kept it out—by bailing. Then I also went around with the mining engineers there. And I worked at Fire Creek and Lupe Creek and for the Collins Bros. at Connellsville for a while, too. This was nice coal but had bad roof conditions. Pots and rolls fell out of the roof. They had a main-and-tail rope—about one of the most useful ones I've ever seen, at Fire Creek. They went in from the top of the grade, in the anticline, down toward the dip, and they ran side ropes into right and left headings. With this main-and-tail rope, they pulled trips up. Very successful.

CA: Well, what brought you back to central Pennsylvania, Mr. Todhunter?

MR. TODHUNTER: I'll tell you. There was more than one reason. We batched down there, the three of us. Times were pretty hard and there wasn't much work. When there wasn't any work we'd fish in the river, and many a meal we got by fishing. I used to come home from work with nobody home to take care of us. You had to take a tub—warm your water, put the tub in the middle of the floor, get down into it, bathe yourself all over and then get up and get supper ready and pack your bucket for the next day.

CA: So you came back to this region, where mining conditions were better.

MR. TODHUNTER: I went back to Clairmont and worked maybe 2 mo. From there I came back to Pennsylvania. I wanted to go to school and was always anxious to get something better. I came back to this region just about the time McKinley was elected. Talk about hard times now—this last depression was nothing to Cleveland's time. I went down to West Virginia and I didn't get another suit of clothes until I was coming back. I'd made a promise to myself that I'd come back as soon as I ever got fixed up.

CA: How long was it before you got that new suit of clothes?

MR. TODHUNTER: Oh, it was 2 yr, I guess. I never saw any worse times in my life.

I worked for a while down at Munson—Royal mine, it was—and then at No. 16 mine, of Berwind-White. Then I worked at Moshannon Shaft. We loaded coal for 55c a ton—2 ft, 6 in of coal and 2 ft of bottom—and you got paid only for the coal. You had to throw the rock into the gob and then throw it back twice to get room enough to gob the rock.

I left that place and went to work at Lenore. I was tracklayer—wood road and wood switches. Then I got pretty active. I was furnace-tender, was a mule driver, dumped cars, sometimes was a laborer. I got to be as-

"I've never believed in hiring and firing. I believe in building."

sistant boss later at the operation.

Then I went to work at No. 28, Berwind-White. That was my first mechanical mine. I mean they had air punchers. In the meantime, I'd taken a course from International Correspondence Schools, up at Scranton. Berwind-White had wonderful projections in this mine, and that helped me much when I was studying. I stayed there long enough to pass the examination for mine foreman.

CA: What was your next job, Mr. Todhunter?

MR. TODHUNTER: Well, next I got a job bossing for Laub Bros., down near Houtzdale. I worked there close to a year.

CA: How'd you come to Barnes & Tucker?

MR. TODHUNTER: I got to know about Barnes & Tucker from a friend of mine, Harry Abrams. Harry told me they needed a man, so I came up.

CA: How'd you come up?

MR. TODHUNTER: I drove from Houtzdale in a rig. It took me from 7 in the morning until 2:30 to get here.

CA: How many miles was that?

MR. TODHUNTER: All together, it's about 30 mi, the way you had to drive at that time. I met Mr. Barnes, the old gentleman, in the office here. He told me a lot of things and hired me for the No. 10 mine.

CA: As a boss?

MR. TODHUNTER: Yes, as a boss in the "E" coal. That was in 1905. I went back and told Mr. Laub I was going to leave him. He said, "Dick, you've done pretty well for me." I did. I was boss. But I tended the pumps, sometimes I would drive the mules, I'd weigh the coal, I'd shift railroad cars—I'd do anything. I was a pretty husky fellow.

Here at Barnesboro I had a chance —something better than I had been in and a chance to make things go. I started at No. 10 mine. No. 10 was standing pretty good and was not far in. I was able to get along very nicely. I came into the company at the time a lot of old men in the company were going out of the picture and when the company needed a new type of mining. Around Philipsburg and Houtzdale the Moshannon coal, as we called it—the Lower Freeport—was petering out and the Barnes & Tucker Co. came into this country, where the mining was different. Down there, in the Moshannon coal, they could go through the mountains and the drainage was good. Not much sulfur there. But up here, they went to the dip, they did a lot of pumping, ventilation was harder and haulage was harder.

. . . But electric motors started coming in about that time, and they helped. I don't mean haulage motors, because they came in about—I'd say about 1896. I'm talking about motors for pumps. When I came to Barnes & Tucker, the pumps were electric but we didn't have pumps like those we've got now.

CA: And you've been here since?

MR. TODHUNTER: Yes, I have.

Since then, I've been with Barnes & Tucker to this day, with many advantages through the favor of the company. I started as foreman, then became superintendent, then general manager. Until I became superintendent, the company had been directed by old types of mining and a lot of changes had to be made. One of these was that no development had been made and no rock shot on the haulages. Water drainage needed a complete overhauling. This gave me the opportunity to put into practice the studying, education and experience in modern mines such as Berwind-White No. 28 Mine. By making a study of elevations in the mines, I realized I could do a lot of ditching and relieve about 30 pumps that were relaying water from one sump to another. While doing this ditching, I also prepared a large sump at the basin of the property, where I installed the first centrifugal pumps. As the mine advanced, my projections were made so the water could be drained to the main

"It isn't fair to outguess a man. That isn't the way to do things."

sump and I then put in larger centrifugal pumps such as one 5000 gpm, one 3000 gpm and one 700 gpm. I pumped this water out an air shaft just above the sump. This large sump lasted the life of the mine.

All the Barnes men helped me in many ways and trusted me. I've done my best to produce, and I've had the privilege of doing things on my own. When I wanted to do something new, about all they'd say was, "Now Dick, be careful." And I'd go ahead.

CA: Well, you look like a man that's come through it all pretty well.

MR. TODHUNTER: Yes, I was always a pretty good fellow, a fairly good athlete. And right now, at 76, I haven't a murmur in my heart. I go out and play golf with the best of them and I've got a lot of good friends —a lot of good friends. And I want them. Without friends, I don't know what I'd do. I go hunting some, too, down close to Georgetown, in South Carolina. I've been going down there for about 18 yr and I always take a bunch of my own men down with me.

CA: Well Mr. Todhunter, things must be a lot different now from the way they were when you first started.

MR. TODHUNTER: Yes. You know, when I first came here to Barnes & Tucker, we had 1,400 men working. We're getting the same tonnage now with 400 men.

. . . But if I hadn't been a mechanical-thinking fellow and hadn't had the opportunity of doing it, it wouldn't be the way it is now. In my time, coal mining has moved from handloading

"The morale of your men is your tonnage . . . and that's your success."

to the continuous miner. I remember some of the old machines. There was a machine that ran into the coal, you know—a breast machine. You first tied it with a big heavy jack at the back and two at the face, and it ran in and then ran out, and the men had to bar it over and run in again, then bar it out and in again. That machine was in our Nos. 6, 7, 8, 11 and 12 mines—the first shortwall machine I knew about in this country. It was a Sullivan.

Then the Jeffrey shortwall came along. The Sullivan was pulled along by a heavy chain but the Jeffrey had a steel rope. We decided on the Jeffrey and we've had them ever since. We converted some 35B Jeffrey bottom cutters into top cutters by extending the shaft and placing the cutter bar on top and then suspending the machine on hydraulic jacks attached to a ½-in plate on the bottom. This was the first machine like that in this country and the Jeffrey people paid us for the rights to build it.

CA: What about still earlier machines, Mr. Todhunter?

MR. TODHUNTER: I got hold of some of the first electric punchers used in coal mines. We had air punchers at the time. A salesman came along and let us have an electric puncher on trial. That was about 1910. I set it up to work in a place where there was a little water—a little damp—and the operator would put his foot on the ground and get shocked. He got afraid of it. So we took that one away. But our mines then didn't have any advance work—only pillars. And so a little later I asked Mr. Jack Barnes to give me a couple of electric punchers.

He said, "What for?"

I said, "I want to pull pillars with them. I think I can cut my costs."

He hesitated a while, and at last he gave me two. They were going pretty well, and he gave me five more. They were going well, so he gave me 10 more. That way, I was able to pull all the pillars in No. 6, No. 7, No. 11, No. 12 and at the back of old No. 4. I advanced headings to where I could get production and saved our company considerable money.

CA: That's a pretty impressive list of changes, Mr. Todhunter.

MR. TODHUNTER: Yes. And I've watched other changes too.

. . . It's not machines that have done it all. We've been helped by bringing in new methods of mining favorable to machines. We used to drive headings about every . . . well, you planned the main headings into your property to go to the extreme end of it. Then your projections were cross headings, which were room-producing headings. You drove your cross-heading in, you drove an aircourse with it, you took up bottom—your rooms had to have bottom taken up—and you tailed them out when you could. And then you had to get hoists to pull the cars upgrade where a man couldn't handle them. And you had to pay for yardage, which was expensive, and hauling the rock out of the headings.

Now we drive panels in. Our mains are about 3,000 ft apart and our panels go from one main to another—1,500 ft toward one another. We take the coal up on the return end of the panel. The men are always on fresh air. We pull the pillars all the way up until we get to 1,500 ft, then go across to the other side and come back the same way we went up with the first left on the panel. And when you get that out you couldn't drive a rat in there. It's caved down and nearly all the coal is out—about 85 to 90%. You have a certain loss on small stumps and caved stumps.

We can do that because our conditions are good. The roof breaks nicely and everything goes all right except for an occasional something that happens to change conditions. That can happen in almost any field.

CA: Do you think those changes have helped keep your company in business?

MR. TODHUNTER: Yes, they have. They tell me lots of mines in West Virginia have shut down. Big, high coal. Our No. 20 mine is 31 in and our coal at No. 15 is 40 in. We're

"You can't visualize what'll be done in the future. But it will be done."

mighty lucky—lucky to have mechanical mining and good preparation and the right kind of people working for us. That way, we offset our disadvantage of thin seams.

CA: What about preparation, Mr. Todhunter? Has it changed much since you started in coal mining?

MR. TODHUNTER: Oh, I can remember when they loaded everything. I can remember when they started picking and screening. I can remember when they started to grade it. We never used to think about grading coal. It was all run-of-mine. Now at our mines we load at least five different kinds and sizes of coal. We've come from picking tables up to precision cleaning.

CA: You said something a little while ago about being mechanical-minded. Would you tell us about some advances you've had a hand in?

MR. TODHUNTER: All right.

I'm the inventor of the "mother" belt.

CA: When was that?

MR. TODHUNTER: January of 1931.

Flight conveyors and shaker conveyors had come into being at that time. But costs were going up and the mines were going farther in, and you had to think of something to get costs down. So I thought about a belt and about how you have to shoot rock in headings to get enough height to satisfy the law—to give your men clearance and protection.

That's how I came to think this out

"That's your tonnage—keeping production ahead."

—that I could cut out all this yardage, all this gathering of coal at the face with small motors, and also these hoists, and thus reduce costs. It looked inviting at the time.

I had to break in new men to do this, though.

They'd tell me, "This can't be done."

"Well," I'd tell them, "I don't know what you mean—'can't be done'—It's got to be done, and it will be done."

So we broke our men into it and they got to see how different it was and how much more convenient and how much easier for them. Pretty soon everybody wanted it.

CA: Then you've been mechanical-minded a long time. Anything new in your mines now?

MR. TODHUNTER: Oh, yes. We've got a Samson Stripper—a Scotch machine. I saw it on the mining-show floor when I was in England in 1949. And looking at our conditions and seeing the machine, I thought it would do a good job for us here. It does mine the nicest coal we've got coming out, and the cleanest coal. It gives us a good quality coal, you don't have to have two shuttle cars, and you don't have a loading machine with it, and you don't have any drilling and shooting. It takes all the coal, and you get a fair tonnage per man with it. Now we're on a 400-ft face, and we move back and forth across the face with it. We make the roof cave in back of us.

CA: That's longwall mining, isn't it?

MR. TODHUNTER: Yes, longwall, retreating longwall.

CA: That changes your mining plan a good deal, doesn't it?

MR. TODHUNTER: It's a change in mining method for this country, yes. I know places where they've tried it several times, but this is about the first try that's been fairly successful. If I'd had these machines years ago to work the block of coal we had then and had planned according to the lay of the seam, we'd have got a better percentage of recovery.

CA: Are you using anything else that's new in the mine?

MR. TODHUNTER: Yes, we've got a Colmol—a big machine with rotating arms on it. We've made some changes in the arms to give us a little rougher coal.

CA: It seems, then, that to move ahead with coal mining a man has got to keep his mind on his job and keep an open mind at the same time.

MR. TODHUNTER: Absolutely. You can't be bothered with a lot of other stuff. If you're a mining man—I mean a face-mining man—you've got to keep your mind on production and costs. You've got to be thinking about it all the time and watch the things that will happen in a coal mine—in any coal mine—that have to be looked for. And your production. . . . You've got to have lots of development so if there's some sudden cave or fault or other condition that comes up to cut your tonnage with those big machines, you're able to shift to keep production up until you get the trouble fixed. Those things will happen in almost any coal mine.

CA: Yes.

But running a successful coal company calls for more than machines. You've got to have men too.

MR. TODHUNTER: That's right.

I think the morale of your men is your success. And I've always kept a pretty close personal relation with our men. That's why when I go to the mines the fellows will say to me, "Hello, Dick. When're you going fishing? How's your rod?"

I used to be very active at the face and was very observant of things going on there. I would go to all the places and have little talks with the men and get great satisfaction from these visits. If my men came into a little trouble, like a clay band, a little dip, a little water, a little bad roof—those fellows wouldn't wait until I came around. They'd go ahead. I'd go to see them and say, "That's all right, boys." And payday, when they asked me to make it up, I'd say. "How're you fellows standing now? How're you fixed? Don't be too hard on me."

"Men are more able than ever—And getting better."

You had their confidence, you know, and they'd do the work for you. That's men.

Then I always used to have a little sports around, you know—athletic teams developing all around here. When I did that, I had the men fighting to win, and I had less trouble with the union. They were thinking about sports rather than trouble.

I've always tried to be fair in every way. I don't think very many men have tried any harder. The little courtesies that I've always practiced have paid out wonderfully in friendship and respect. Courtesy is due everybody, and there are very few men who won't accept it. Those that won't accept it, you release as soon as possible.

But you give a man a chance to try to make himself into something. I've never believed in hiring and firing. I believe in building. Anybody can tear and pull, but it's getting the right feeling that makes your production what it should be.

CA: Have miners changed much since you entered the industry?

MR. TODHUNTER: You know, men are more able now than they ever used to be. They grow along with the industry.

Our "mother" belt made a better class of miners. And then shuttle cars and the loading machine came in. That cut out handloading into conveyors. And then, those better men helped you when you got these continuous miners. Mining was more inviting to them because it made a better job and made a better man.

I remember when I first came here. Times were bad. It wasn't living the way people should live. When you have a disgruntled set of people around, nobody is right. It can't be. But when you have people who are satisfied, things are different.

We sold our houses around Barnesboro in 1927. It was the best thing we've ever done. The people started to fix up their homes, build fences, put running water in. The children got dressed up cleaner and the men and women were feeling better. It developed a lot of things we didn't have when the company owned the houses. After a miner owns his house, instead of destroying, he's building. And no one makes a better class of citizen—clean citizens.

CA: Your men have improved over the years, then?

MR. TODHUNTER: Oh, I'm sure they have. I'd say 60 to 65% of our miners now are high-school graduates. And they like to go in the mines now. You have a much more efficient, more intelligent and more considerate man.

CA: Do you think the wage scale draws better men?

MR. TODHUNTER: Well, I think the wage scale gives you more labor than you'd have otherwise. The lowest going rate now in the mines is $18.95. If a man works time and a half or double time, see what a difference? I'd say the miners on the average have a better standard of living, better living conditions. And I think they are more reliable.

CA: Do you have any troublemakers around now?

MR. TODHUNTER: I'm going to tell you something. The morale of your men is your tonnage. I can remember how I started to change things when I first came here. I've never heard so much cussing in my life. I had more Johnny-bulls—and I'm one myself—to move out of the road than enough. And I won. When you move people, you know, you get a bad name. They don't see your objective. But if I hadn't done these things, what would have happened? This town wouldn't be the way it is. I think Barnes & Tucker have made this district what it is—very good people.

I never wanted any man to go in the hole for me. It isn't fair to a man that you can outguess him. That isn't the way to do things. It isn't "doing" a fellow that gets you anywhere. It's getting your work done at the right price—efficiently done—and when it's over, you are friends.

CA: Do you think relations between management and men will keep on getting better?

MR. TODHUNTER: I'm satisfied it'll turn out that way. And I think it's only reasonable that it should be that way. I think mine management knows these things have to come—and will come. You respect a man who's respectable, has a nice home and car and goes out with his family. Those things make a big difference. Some of our miners have two cars—one at home and one at the mine. Not only one, but lots of them. The Mrs. can take a little ride with the kids when she feels like it. And I feel good about it. That's all right.

CA: What about management, Mr. Todhunter? Do you think it'll keep on improving?

MR. TODHUNTER: Oh, there's no mistake about it. These efficiencies that are being developed—there'll be more of them to make mining more modern. It's happened all my life. I've been at it now for 66 yr, and I never saw it get worse—always improvement.

CA: What was about the worst year you ever had, Mr. Todhunter?

MR. TODHUNTER: The worst year? The worst year I ever had, I'd say, was when No. 12 drowned out. That was a Barnes & Tucker mine. I didn't have charge of the pumps at that time but after it happened I was called to the office and told, "Now, Dick, you've got charge of everything in that mine." I stayed one week at the mine without going home, and I had the first centrifugal pump ever brought into this region—a DeLaval. A little fellow came to install it. The water was 'way up before we got the pump started, and I had to lend the fellow my No. 7 boots and I put on his No. 5½ shoes and walked in the water. That was serious. I was afraid we were going to lose everything.

CA: Well, there's the other side of the coin. What was the best year you ever had?

MR. TODHUNTER: We've had lots of good years and we've had, on and off, bad years. But the most successful year was when I got the "mother" belt going in panel work. I think we saved a lot of money and made it convenient for the men to work. But we had other good years, too. One year, we loaded at our mines 1,035,000 tons. That was when Mr. Jack Barnes had two 10-yr contracts with Public Service of New Jersey for 1,000,000 tons a year. They were wonderful contracts and gave me a chance to do things that other people couldn't do, because I knew we had the business behind us. What I did was to advance headings—never stopped a heading until it got to the boundary, if possible, so we always had production ahead of us. That's the tonnage of any coal mine—how you keep your production ahead.

CA: Looking back over the years, Mr. Todhunter, would you do anything differently if you could start over?

MR. TODHUNTER: Well, there are lots of things I know now that I didn't know then. But I'd still be a mining man. That's all I wanted to be all my life, and that's what I ended up doing. And being trusted, as I have, and with disadvantages, too—it's been a wonderful thing. Many discouragements I've had—many. We've had troubles. Coal mines are full of trouble. You've got to be able to beat them out—meet them as they come and have them fixed before the next one comes, because it will come.

CA: But if you listen to coal men, they talk more about bad times than good times. If it's so bad, why do they stay with coal?

MR. TODHUNTER: What else was there for me? That's all I knew. And that's what I wanted to be. Everybody was looking for a job when I started. But I figured it wouldn't be the way it was then all the time. Surely some improvements would come out of what was happening and what was learned, so we'd be able to protect ourselves better than we did before. I figured times couldn't get any worse.

I don't think we'll have bad times the way we used to. I think government can regulate and provide where we may have cycles of this and that. Government ought to be able to take care of production and living conditions, so we won't have anything like the depressions we've had. You talk about the depression of '33, '34 and '35. I don't think it was anything compared to what it was in '96 to '98. I had one suit of clothes. Many times when I was 18 or 19, I'd go in the mine with worn-out shoes on.

CA: Well, Mr. Todhunter, can you see any changes in markets ahead—changes that'll affect your coal preparation?

MR. TODHUNTER: Oh, there's more efficiency being developed right along. The first I noticed was when those big power companies began to build plants around coal mines. There have been more efficiencies developed to take care of the qualities they wanted—at a price. The big companies want the best you can give them—and then ask for more. **TURN PAGE.**

CA: So you look for more advances in coal cleaning?

MR. TODHUNTER: Oh, I do, I do. It's always been that way for these last 30 yr—improvements, improvements, improvements.

CA: These big utilities that buy coal—do they give you a chance to make a little money?

MR. TODHUNTER: Their attitude is, they're interested in their profits, not yours. They figure you'll have to get more efficient production because they've always done it. I can remember when a kilowatt-hour cost 3¢. Now it's less than 1¢. That's some improvement, isn't it? I can remember when you had to shovel coal into a boiler and you didn't know much about it. You filled the fire up with a lot of black coke and you growled because you couldn't get any heat. Next thing you know, they've got stokers for firing boilers. And then they got more efficient. They used to brag about smokestacks. Now they figure every bit of ash and heat. They don't let their dust go out the stack. And they regulate their heat and their fire and everything else by meters and controls.

CA: Do you envision any different ways of getting coal to market? After all, railroad transportation is pretty clumsy—bulk fuel and empty cars returning.

MR. TODHUNTER: Some people talk about piping it but that can't be done all over the country. If you build big plants that are going to be there for years and years, you could do that and save some money. But I believe the railroads could cut transportation costs down now. Right now, it's absolutely too much. You load a 70-ton car, and it costs close to $4 a ton to lay it down at the market. That's pretty expensive. It's why some people are looking around for some other kind of fuel to run their machines. That's why so much oil is used.

But I tell you we haven't seen the half of it yet. Some day they may take coal out differently from the way they do now. You can't visualize what will be done—but it'll be done. Right now, you need a lot to go with the continuous miner—a conveyor to follow it up, some way to cut mechanical repair expense.

CA: Well, Mr. Todhunter, do you think the same opportunities you had are open to young men now coming into the coal mining industry?

MR. TODHUNTER: It's open for the young men that have the energy to go after it and common sense to bring it out. There are advantages in this country for anybody that's got the ability and initiative to go to it. That's the only thing that ever pulled me through.

"I played marbles—to win . . . baseball—to win."

CA: What would you tell a young man who came in to see you about a job—about his chances of getting ahead?

MR. TODHUNTER: Well, I'd have to know him personally—know his ability, his initiative and his idea of going into mining. And then it depends on how we hire him. If we hire him for a certain job and he wants to build himself in, it's how he goes about it, how he feels about doing things.

CA: When it came time for your sons to go to college and then start work, did you advise them to go into coal-mining?

MR. TODHUNTER: I tried to let them decide for themselves. Their success depends on their common sense, their ability to do things—the things they've been taught, which is maybe an easier way to get it than I ever had.

But the next thing to make a success is to get on the right track. If you growl about this, pick out this and pick out that—that isn't progress, that isn't building. There are lots of chances for everybody, and they don't depend on favoritism. I never did.

I say, if a man isn't productive for you, you shouldn't have him. If he can see the light when you want to treat him fair, and if he feels right, he'll give his intelligence to his work and give you suggestions that might not come to you. I've lots of men under me that have done a lot of good for me—maybe better than I would have done for myself. They are builders and they are go-getters. They are serious and they enjoy their work and love their jobs. When you get men like that, those fellows are going places.

CA: Do you have any trouble finding men to work for Barnes & Tucker?

MR. TODHUNTER: No, we don't. Let me tell you: Some operators haven't much consideration for anybody. That's the wrong thing. This company, as long as I've known it, has been very considerate of its men. While at times it's been rough and hard, we always figured that the happier you can keep your men, the better off you are. I've always tried to help men get along. The people that have got charge of you, they count a lot. The important thing is how they can build with a young man, see what he wants to do. If they don't go along with a fair-thinking fellow, it's only to their own disadvantage. When old Mr. Barnes died, young John Barnes came in. And when he got to know me and I wanted to do something, the only thing he'd say to me was, "Be careful." Then I'd go ahead. That was pretty nice, wasn't it?

CA: It was that.

But let's look ahead a little bit. How do you see coal's future?

MR. TODHUNTER: The next few years may be tough, but we'll get over the hump. I'm satisfied we're in a bad slump right now and I can't see anything but the survival of the fittest, because this residual oil that's coming in from foreign countries is killing business. It doesn't give our people a chance to live the way they should live. You know, if people have property and if they are smart enough, they start to scheme to take care of things in hard times. But when the impossible comes, they have to throw up their arms and quit. That's what a lot of people are doing now in the coal industry.

CA: But you think it will be possible to last it out?

MR. TODHUNTER: I do. I'll tell you why:

I'm just a lucky fellow, but it isn't all luck. I've got along because I've always wanted to win. I used to play marbles as a kid—to win. I used to pitch quoits—to win. I used to play baseball—to win. I used to go fishing and try to beat the other fellow. That was always the punch. And I always had a good feeling about it.

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You can count on this rugged, dependable, proved-in-the-mine line of machine bits, auger and roof drill bits and finger (strip) bits in styles and sizes to meet every mechanized mining need.

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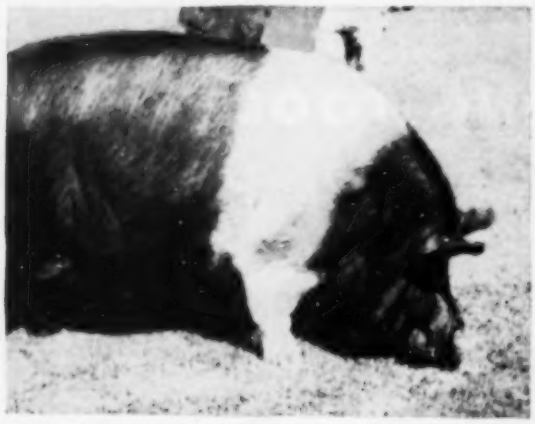
Foremen's Forum



IT'S A LONG WAY from a sow's ear to a neat-as-a-pin entry as shown at the right, but you can make the switch if you apply imagination and persistence in finding bad situations and cleaning them up.

Sows' Ears and Silk Purses

Making something worthwhile out of an unholy mess is a job you may often face. Here are the rudiments of a system for helping you find messiness in the mines and for taking steps to eliminate it.

OF A PERSON WHO CAN MAKE A THING OF BEAUTY out of ugly raw materials, it is often said, "He can make a silk purse out of a sow's ear." It's a good reputation to have.

Getting ideas, teaching others and making these silk purses may appear on the surface to be abtsract pursuits that do not lend themselves to an organized approach, but you will recall that some time ago we talked about the technique of getting ideas. Here are the five definite steps:

1. Gather all the facts. Don't overlook anything.
2. Digest these facts. Sort, combine and arrange them.
3. Sleep on them. The idea is jelling in the nooks and crannies of your mind even though you think you have forgotten it.
4. You feel the idea taking shape and soon it presents itself in all its shining glory.
5. Refine and apply the idea.

Then sometime later we discussed the fundamentals of teaching. There are five elements, as follow:

1. **Explanation.**
2. **Demonstration.**
3. **Interrogation.**
4. **Application.**
5. **Examination.**

Apparently, then, there are definite procedures for getting ideas and for teaching others. They are not the abstract pursuits one might think them to be. To put it shortly, you don't have to be a genius to get good ideas; you merely have to go about it in the right way.

Let's cogitate now with the object of setting up a similar definite procedure for synthesizing a silk purse from a pig's ear.

In the first place, we must find a pig's ear—ugh. We shouldn't have too much difficulty on this score because, as we shall see later, most of us are knee-deep in pig's ears.

In the second place, we must examine the specimen [retch] to determine whether any silken qualities lie buried in the cartilage.

Thirdly, we must stop and think. If we miss this step, we're dead. Having found an ear, and having decided we can do something to improve it, we can't make certain progress unless we think about what we are going to do and plan our future steps.

Next, we should make a vow that in the future we shall not cut off and throw away any more pig's ears. (We mean that having recognized a bad situation, we should pledge that we will stop doing those things that finally build up into a bad situation.)

Finally, we apply the remedies that our thinking and planning in Step No. 3 have developed. Our point-by-point system now shapes up something like this:

1. Find the practice or situation that gives you trouble. Untidiness is an almost universal sign that something is wrong. A spic-and-span atmosphere always surrounds safe, efficient operations.
2. Study the bad practices or situations and select those which are most damaging to the safety, efficiency or economy of your mine or section.
3. Manufacture some ideas, using the technique for getting ideas, that can be applied in eliminating the unwholesome conditions.
4. Resolve that henceforth the tendency to commit these crimes against the principles of good management will be subdued as much as possible.
5. Clean up the existing bad situation.

Now let's cast about to see if we can identify some sow's ears in your mine or section and come up with suggestions for converting them into silk purses. And in the coal mines, when you turn a sow's

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Mine Lubricants

One for all...

More and more midwest mines are realizing important savings through the versatility of SUPERLA Mine Lubricants. Inventories have been simplified and over-all lubrication costs reduced.

In one mine, a SUPERLA Mine Lubricant was adopted for use in main transmissions and gathering heads of Joy loaders and in the wheel bearings of coal cars as well. In over three years' operation, there has been no downtime because of scored clutch plates or faulty lubrication. In the cars, leakage of lubricant from bearing housings has been eliminated.

Also in this mine, a SUPERLA Mine Lubricant has provided trouble-free lubrication in the transmissions of Goodman loaders and in the gear cases of cutting machines. In more than three years of operation, there have been no cases of downtime of loaders or cutters due to faulty lubrication. Warm-up time for the loaders has been eliminated.

These are the big jobs, but the versatility of SUPERLA Mine Lubricants covers a wide range of applications from motor armature bearings to loading machine hydraulics. The chances are you can replace several special-purpose lubricants with one or two SUPERLA Mine Lubricants and get better lubrication results in each case. There's a Standard Oil lubrication specialist located near you who knows mining equipment and who will work closely with you. To reach him, you need only call your local Standard Oil office, or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY STANDARD *(Indiana)*

Seven Rules for Success

Here are seven rules for success as offered by George A. Bahm, superintendent—shops department, Youngstown Sheet & Tube Co., to eight graduates of the company's shop training course. As they appear in the Youngstown Sheet & Tube *Bulletin*, Mr. Bahm's rules are:

One of the first and most important things you should do is to establish a reputation for stability, fidelity of purpose and determination. Know the purpose and policies of your management and your immediate supervisor so you can carry out instructions quickly for the best interest of all.

Second, develop an ability to anticipate changes. We are constantly changing, so train yourself to anticipate these changes and be ready for them. Changing a process may result in changing policies and the over-all purpose. You must always remember that situations and circumstances, either in effect or planned, are the final authority for action.

Third, let your personality and determination take a back seat to achieve some over-all objective in principle or policy. Perhaps you have an idea and someone else has an idea. Your idea may not be adopted while the other fellow's may. Remember that ideas originate and grow, then are sifted and studied before the best ideas are adopted. If this happens to you, don't feel that someone has it in for you. Humble yourself—take a back seat. The Bible says, "He that humbleth himself shall be great."

Fourth, and in the same vein, is to inspire others in their work and their ideas. Man's greatest instinct is to create. He feels he belongs to a group and is important when he gets credit for some achievement. Work for the greatest over-all group achievements. Give the other fellow credit. Say "We," not "I." People like to be included in achievements. They support you when they know you believe in them and give them credit.

Fifth—never give up. Set a goal and work for it. Don't let disappointments or obstacles stop you—at least permanently.

Sixth—and this is of great importance: When you are discouraged, never go to another discouraged person for sympathy. Two wet rags only intensify the dampness. In moments fo discouragement or weakness, go to the strong for help.

Seventh, you can gain and hold the respect, helpfulness, consideration and admiration of others only by the respect, helpfulness and consideration you show to them. You can succeed only as the group succeeds. By your loyalty in attitude, action, determination, application, constant observation, study and growth you will prepare for a better position. Loyalty in its fullest implication is a virtue of great value and is valued Loyalty to the principles, policies and problems of your company is a must if you want to advance.

In your work you will meet many people, Mr. Bahm says. From them you can learn much that will help you do better work and prepare for a better job. Don't discount the other fellow. From one you may learn what to do—from another you may learn what not to do.

---

ear into a silk purse, you always find—wonder of wonders—there is money in the purse.

• **Hazardous Conditions**—Bad safety conditions cannot be tolerated, of course. In the roof and in the haulage system are the first places to look, although you naturally should already be insisting upon high-quality timbering and tracklaying. If you or others have been less than perfect in this respect, however, begin now to promote better installations. Then perhaps you'll have more time to go back and correct some of the haphazard work of the past.

• **Sloppy Work**—Again, it's a matter of calling a halt on bad practices and instituting approved methods for doing work and for using tools. Have a set of standards on paper or in your mind, then see that the work in your mine or section adheres to these standards.

• **Poor Housekeeping**—Like the confusion surrounding the chicken and the egg, it is difficult to say whether poor housekeeping is a result of sloppy work, or vice versa. One naturally leads to the other, and both create hazardous conditions. It begins to appear that this whole business of making silk purses depends upon stopping where you are and taking off in a more-promising direction.

In our editorial travels we have seen any number of mines and sections where you could, as they say, "eat off the floor." They are a credit to the industry. On the other hand, we have seen some real duck farms. To the supervisors of these unnecessarily cluttered properties, there is only this to be said: If your bookkeeping is anything like your housekeeping, heaven help the company.

• **Wasted Materials**—It is quite easy to waste materials because single supply items seem to have the knack of slipping through one's fingers into the gob. We know that no one throws away supplies in wholesale lots, but that little trickle through the fingers of so many supervisors and employees adds up to a flood. You can convert this pig's ear into a silk purse by keeping your eyes open for signs of waste and by matching your requisitions to the amount of materials you see actually installed.

• **Wasted Time**—Man-hours and machine-hours are two of the highest-cost tools you have to use in recovering coal. That cost is doubled when man-hours or machine-hours are wasted, since there is no reduction in their cost and you lose the production that really pays for them. Savings can be made on this score only if you examine your operating cycle with the object of routing out the delays that result in man or machine idleness. Your best contribution will be in identifying the cause of the delay so that your top management can take corrective steps.

• **Wasted Effort**—Energy costs money, whether it be the chemical energy in explosives, electrical energy for machines or the muscular ergs expended by men. Again, study your cycle to be certain you're not wasting energy. For example, your machines may be backtracking unnecessarily, your shotfirer may be overcharging or your work may be so laid out that the men are playing the old army game—move it over here, now move it back. Look at it this way: There is a definite amount of heat energy in the coal your mine or section produces. The less energy of all forms you expend in getting that coal out of the ground, the greater the energy dividend remaining in the coal. Your company's good health demands that this energy dividend be of respectable proportions.

Making silk purses out of sow's ears is not the easiest chore in the world. It is most difficult when you find the ears cluttering up your relations with the men you supervise. Excessive grievances, lack of enthusiasm and downright churlishness are examples of what you can expect from your men when the unsightly ears come between you and them. Well, what can you do about a situation like this? Your most rewarding starting point will be in that searching injunction, "Physician, heal thyself."

Be certain that your own troubles are not limiting the top-drawer performance of your job. Know your job well enough to merit the confidence of the men. Know your rights and their rights to prevent a lot of grievances from going over your head. In short, be serious about your job and be concerned about the way you discharge your duties.

Making silk purses may not be easy, but it certainly is gratifying. It requires a systematic approach, imagination and persistence.

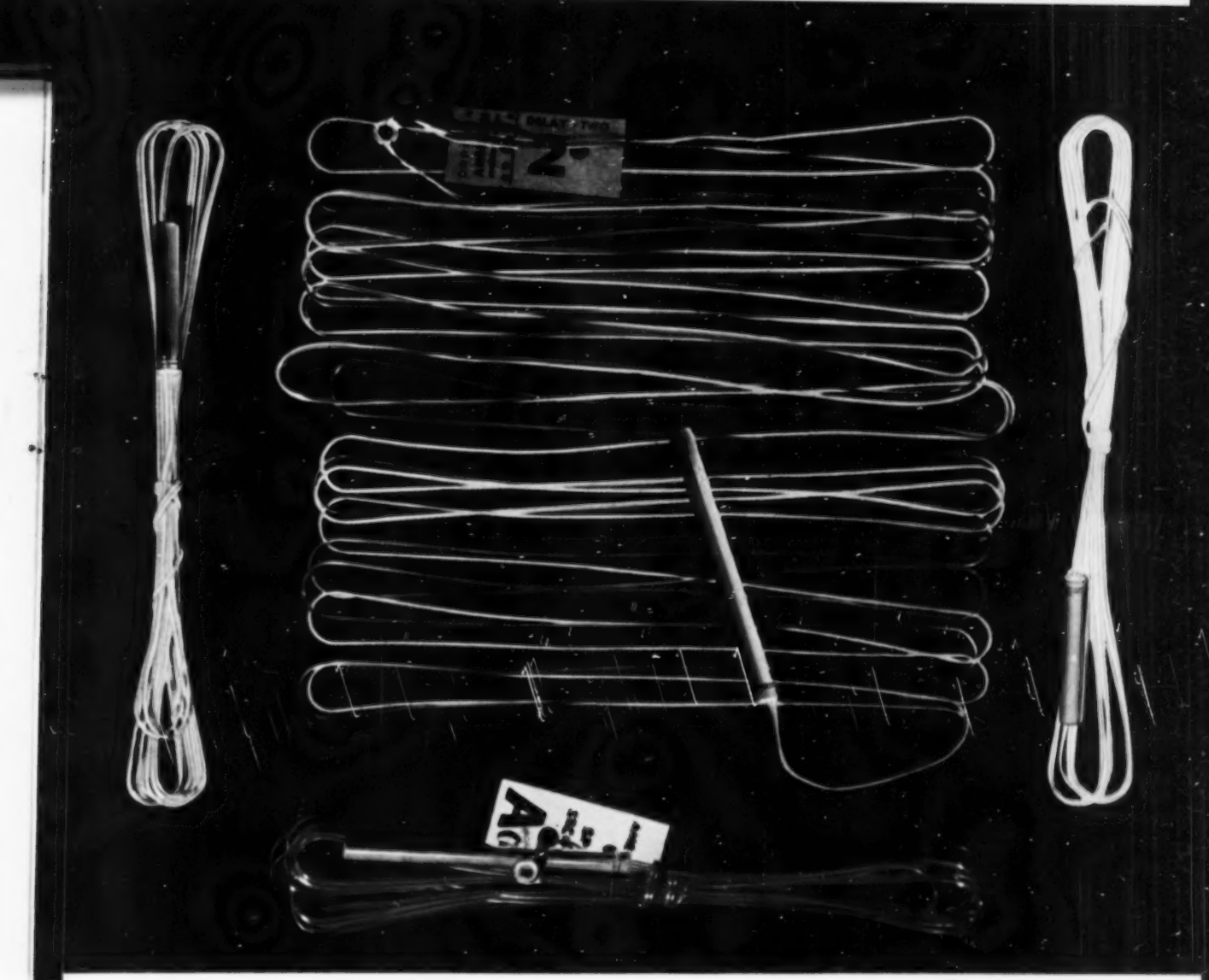
Quips and Whips . . .

Cole Peddler came into the office this morning with a really handsome "black eye." Seems he went into an antique shop yesterday and asked "What's new?"

The little girl who used to grasp a penny firmly in one hand and press her nose against the glass in a candy counter has now grown up and can be seen at a meat counter with the same look on her face as she clutches a $10 bill.

One thing we would like the doctor to explain is, why a baby never sneezes unless he has a mouthful of cereal.

—Reprinted from *Hotstuff*, Cortright Coal Co.



Now available!
Superior insulation featured in new Cyanamid blasting caps

AMERICAN CYANAMID COMPANY
EXPLOSIVES

Cyanamid has for many years been conducting a study of all materials available for blasting cap wire insulation to find one that would offer uniform concentricity—no thin spots. Every type of insulation currently in use has been tested, as have many new materials. Now Cyanamid has an insulation that gives *uniform concentricity*, assures maximum performance!

This new, organisol plastic insulation is applied to wire by a continuous bath method. The wire is dipped in *seven separate baths* and is passed through dies to scrape off excess coating between baths.

Color-Coded for Easy, Sure Identification

Instantaneous, copper wire — Instantaneous, iron wire — Standard Delay — Split Second Delay

Each coat is heated to insure perfect set, perfect concentricity. Organisol plastic insulation, because of its uniformity, gives you:

1. **Greater electrical insulation values**
2. **Greater flexibility**
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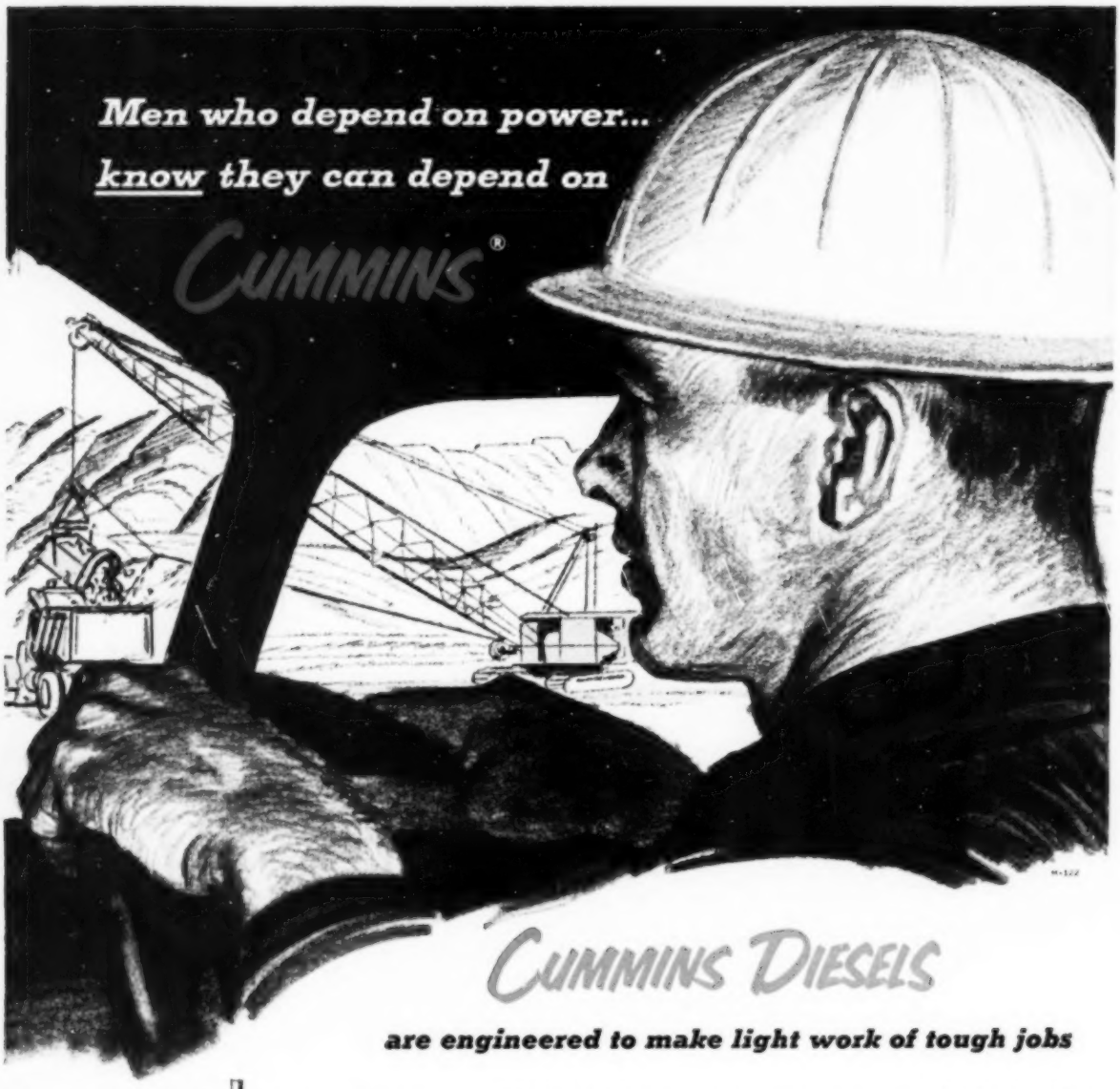

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Why do so many mine operators count on Cummins for dependable power in toughest going?

You'll find part of the answer in the special kind of versatility that belongs to Cummins Diesels alone. It's versatility that goes beyond the handling of all kinds of jobs. It's actually an ability to meet every power requirement that any situation demands . . . to save on fuel, do more work per dollar, whether the call is for continuous power or stop-and-go operation over a wide and flexible speed range.

Yes, you can count on a (60-600 h.p.) Cummins Diesel for dynamic versatility in every job—performance that stems from an exclusive fuel system and precision engineering. See your Cummins dealer for all the facts. He's a diesel specialist . . . ready to help solve your power problems.

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JENKINS
Fig. 106-A
Renewable Composition Disc

BRONZE GLOBE VALVE

150 lbs. Steam
200 lbs. O.W.G.

Take a Jenkins Fig. 106-A apart. It's easy to see why it is industry's all-time favorite. Note the liberal dimensions of body and bonnet casting — the heavy, manganese bronze spindle, with more strong threads in contact with the bonnet, regardless of spindle position. See how the slip-on, stay-on disc holder fully protects the edge of the disc, prevents creeping, flaking, or cracking.

Every part, from perfect grip, heatproof handwheel to pipe ends, reflects the designing skill of Jenkins valve *specialists.* There's a good reason. Jenkins Bros. introduced the *first* renewable composition disc valve, — is today the only manufacturer of both valves *and* discs.

Fig. 106-A not only looks better — it proves out better in performance. In any comparison, its long life, low upkeep record has never been surpassed. That is the true measure of valve cost — and it is the reason why industry's shrewdest buyers will settle for nothing less than Fig. 106-A quality.

JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SINCE 1864 JENKINS

Jenkins Bros.

GET THIS FOLDER — Gives details of Fig. 106-A design, and "family" interchangeability. Ask your Jenkins Distributor for Form 189-A, or write Jenkins Bros., 100 Park Ave., New York 17.

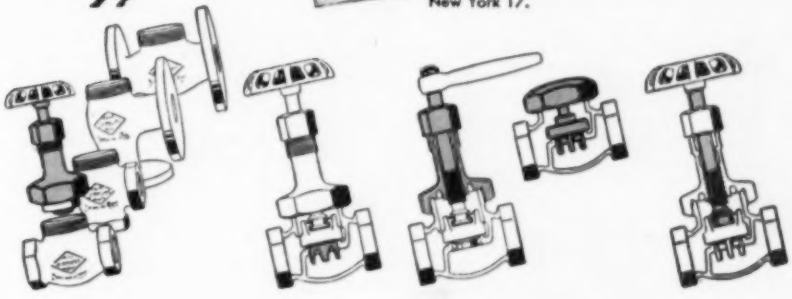
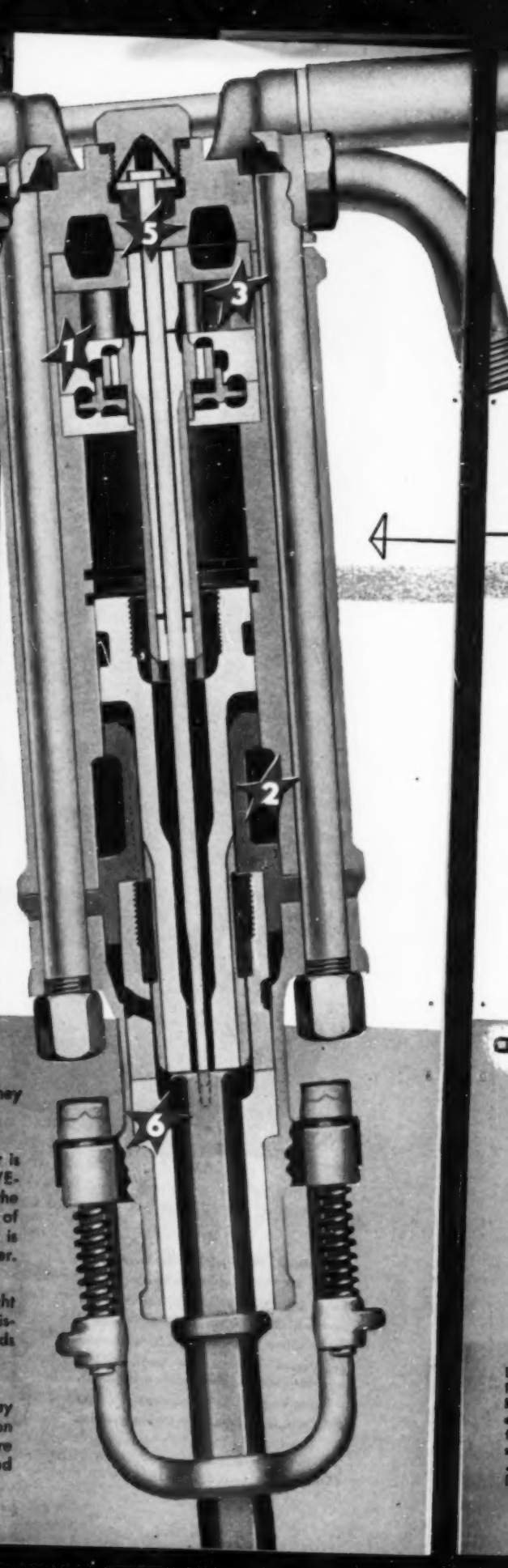


Fig. 106-A "Family" interchangeability meets 90% of your valve needs with a small inventory of parts. Start with the standard Fig. 106-A. Trimming is interchangeable in Globe or Angle body, screwed or flanged. With a few parts, quickly-assembled combinations provide a Lift Check, a Spring-loaded Check, and valves for Stop and Check, Quick-opening, or Throttling service.



Design Features

1 End-seating valve is fast and positive in action. It meters the air efficiently — keeps air consumption down, provides powerful force of blow and strong rotation. Performance of valve is not affected by wear.

2 Positive lubrication system distributes oil throughout the machine and insures long life for all moving parts. Rifle bar is oiled at every stroke of piston. This prolongs the life of rifle nut and rifle bar at least 50%.

3 All Le Roi-CLEVELAND Sinkers are famous for strong, positive rotation. That's why they are at their best when the drilling's the toughest. Properly designed rotation parts—ratchet, pawls, rifle bar and rifle nut—plus efficient lubrication of these parts, give you this important drilling advantage.

4 Exhaust ports are large — they avoid freezing.

5 Plenty of hole-cleaning power is provided in all Le Roi-CLEVELAND Sinkers, so that you can get the most out of their powerful force of blow and strong rotation. Bit wear is reduced and drilling speeds are faster.

6 Floating-type chuck permits slight misalignment without binding piston. This reduces piston scoring, adds to life of the machine.

7 Throttle valve is designed to stay in any desired operating position from full-on to blowing. All parts are fully enclosed, protected from dirt, and generously lubricated.

Built to meet the DEMAND

Here's the "inside story"

of why Le Roi-CLEVELAND Sinkers drill more footage per shift, stay underground longer

THERE are things you *can't see,* behind Le Roi-CLEVELAND dependability—"hidden values," design details. But you know *they're there*—because that's why Le Roi-CLEVELAND Sinkers drill more feet of hole per shift . . . why they run at peak efficiency day in and day out . . . why they lower drilling costs on any job that requires a hand-held drill.

It's Le Roi-CLEVELAND *engineering* that gives you performance advantages that really pay off for you: Low air consumption. Easy handling. Strong rotation. High drilling speed.

Le Roi-CLEVELAND has a complete line of sinkers from 18 to 80 lbs. Your Le Roi representative can show you why you're money ahead with any one of them. See him soon.

Write for free Bulletin No. RD25.

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Plants: Milwaukee, Cleveland and Greenwich, Ohio

H23 — 83-pound sinker Dry and wet types. 1"x4¼" hex or quarter-octagon. 1⅛" or 1⅜" lug shank. Designed for shaft sinking in hard rock or bad, faulting ground . . . general drilling with heavy steel in hard rock.

H10 — 45-pound sinker Dry, constant blowing, and wet types. ⅞" x 3¼" and 1" x 4¼" hex or quarter-octagon chucks. Wet automatic dust-control back-head, if desired.

H166 — 33-pound sinker Wet and dry types. ⅞" x 3¼" chuck. Recommended for hard coal. Also ideal for wet or dry drilling in shale, limestone, sandstone, etc.

H22 — 18-pound sinker Wet and dry types. ⅞" x 3¼" chuck. Recommended for: Drilling holes for trolley hanger bolts. Cleaning up roof. Clearing out rock falls. Brushing bottom. Drilling oversize pieces at grizzley. Cutting hitches.

H111 — 55-pound sinker Dry, constant blowing, and wet types. 1" x 4¼" chuck (⅞" x 3¼" and popular sizes of quarter-octagon and lugged steel chucks also available.) Wet automatic dust-control back-head, if desired. Primarily designed for hard rock, but equally efficient in soft and medium formations.

Air-feed mountings up to 10' steel changes.

RD-25

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For Working Small Narrow Pits

- All the proven features of models 42 - 48 - 56
- Smaller
- More mobile
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MODEL 36 COMPTON COAL AUGER

See Model 36 in action at the
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COMPTON Model 36 Coal Auger

designed for { Maximum recovery ...at Minimum cost

The new Compton Model 36 Coal Auger is the answer to the demand for rapid, economical high wall recovery in small, narrow pits. Only 36 feet long and weighing approximately 25 T., the Model 36 includes all the design advantages of the other Compton Coal Augers.

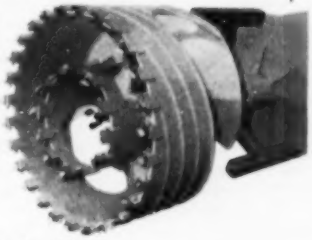
- Convenient, accessible auger sections racked on the frame.
- Synchronized winches for handling auger sections.
- Hydraulically operated pilot pan eliminates spillage between machine and highwall.
- Elevating conveyor is integral part of machine.
- Hydraulically-controlled swiveling discharge chute permits uniform trimming of trucks.
- Hydraulic jack legs (with self-leveling pontoons for better floatation) allow drilling up to 160 feet without misalignment.
- Single or vertical overlapping holes can be drilled in varying coal seam thickness.

The Compton Model 36 Coal Auger paves the way to higher quality through selective mining! Up to 60 Tons per hour recovered in actual production tests! Plan today to expand your present or future developments with Compton Coal Augers.

(Write for details about other Compton Auger Models 42, 48 and 56.)

Model 36 SPECIFICATIONS

Length: 36 *feet* *Weight: Approx.* 25 *T.*
Carries eight 20 *ft. auger sections*
Required pit width: 38 *feet min.*
Power: 150 *hp Diesel engine*
Hydraulic Frame Jack Lift: 54 *inch*
Auger Diameters: 44 *inch to* 24 *inch*
Possible Drilling Depth: 160 *feet*



The Compton Cutting Head — non-clogging type with a built - in spider bearing assembly — increases production by drilling straighter holes with less frictional drag.

Consult a Compton Engineer for Details

Compton, Inc.

ORIGINATORS OF COMPTON LUMP RECOVERY HEADS

BOX 1946 — PHONE 4-6384 CLARKSBURG, WEST VIRGINIA

Operating Ideas

NEW RADIO-EQUIPPED AMBULANCE is inspected by John E. Merryman (left photo), safety engineer at Georgetown No. 12. View at right shows interior with cot, resusitator and divided drawers for storing small supplies.

Radio-Equipped Ambulance Speeds Aid to Injured

EQUIPPED WITH A TWO-WAY RADIO and various first-aid and emergency equipment, this new ambulance serves the large area included in the Georgetown No. 12 operation of the Hanna Coal Co., Div. of Pittsburgh Consolidation Coal Co., St. Clairsville, Ohio. The ambulance is a reconditioned panel truck with special springs for easy riding. To provide space for the first-aid and emergency equipment and a cot for the patient, the interior of the truck was rebuilt with divided drawers beneath the new floor to hold small first-aid supplies and built-in racks for larger equipment.

The two-way radio permits the safety engineer to keep in constant touch with the various working areas covering several miles at Georgetown. In a matter of a few minutes after receiving a call, the ambulance can be at the scene of an accident. Among the equipment available for treating the injured are a resusitator, an inhalator, an aspirator, blankets, all types of bandages, splints, sterile dressings and many other items needed to render complete emergency treatment.

In charge of the ambulance under Safety Director W. J. Schuster will be John E. Merryman, safety engineer at Georgetown.

"This is one vehicle that I hope is never put to its intended use on this property," Superintendent C. L. Secrest said, as he presented the new ambulance to the Georgetown safety department.

How a Good Locomotive Operator Does His Job

TROUBLE-FREE HAULAGE demands effective preventive maintenance and sensible operation of the equipment. Here's a short checklist to guide you in observing how your locomotive operators handle their units and in correcting bad habits.

A good operator never starts against dead-set brakes.

He never plugs a motor when he should be using the brakes.

He is careful in sanding up. He keeps trash out of the sandboxes on the locomotive and you'll see him choose the driest sand he can find.

Backpoling is out. The good operator is not a gambler with his life.

He operates the controller handle from step to step, giving the motors time to pick up rated speed at each step. Furthermore, he doesn't run "on resistance" for prolonged periods.

He knows how many cars he can start and pull, so he never overloads his trips.

You'll see him inspect brakes, sanding equipment, trolley shoes and other accessories whenever he has some time.

His safety equipment, such as triplights, rerailers, headlights, first-aid kit and alarm bell, are always in order.

He reports any electrical or mechanical troubles he finds.

When breakdowns occur, he knows what to do to prevent further damage. For example, if he has trouble with one motor he will raise the brushes of that motor and sidetrack the locomotive for repairs.

He lubricates his machine in the proper manner and on schedule.

UNMATCHED DEPENDABILITY

THANKS TO BATTERY POWER!

You can always depend on battery-powered shuttle cars to work full-shift without letdown. They have fewer moving parts, fewer friction surfaces to cause downtime, no trailing connections, have in-service records that can't be matched! Cars powered by Gould batteries move more tons more miles, move coal faster at lower cost, move it continuously day after day for years! And of course, they give you SAFETY unequalled by any other type of power.

Visit us at the American Mining Congress, Cleveland Auditorium, Booth 1103.

Specify
THE GOULD "THIRTY"—
America's Finest
Mine Shuttle Car Battery

GOULD INDUSTRIAL BATTERIES

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

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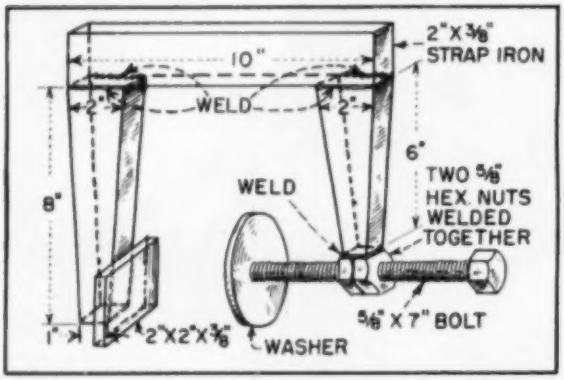
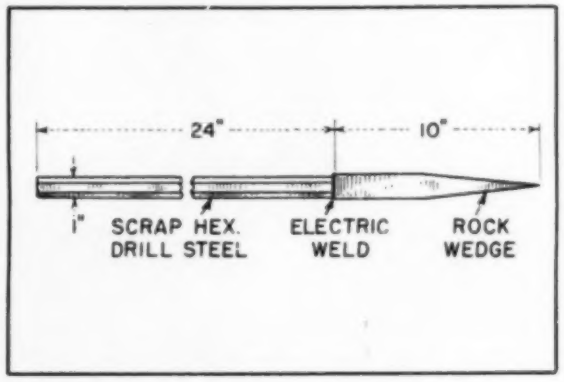
Quick-Made Gadgets Improve Maintenance and Safety Around the Mines

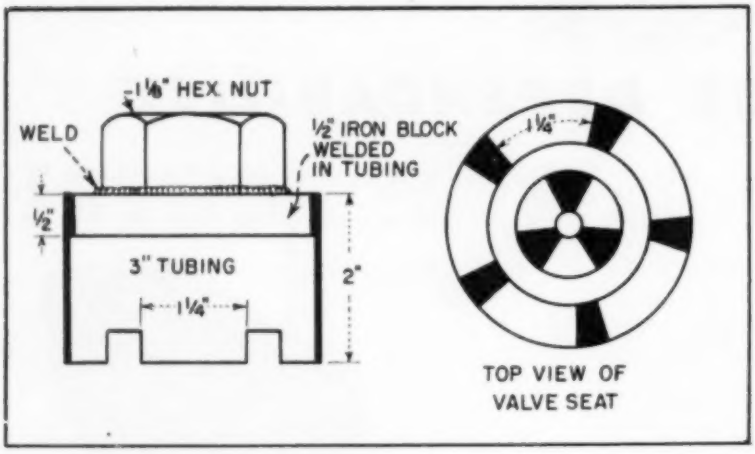
Here are three handy time savers and a safety device that are paying off at the mines. Made from miscellaneous scrap material, the four gadgets are the results of the efforts of Harry R. Lanier, electrician helper, The New River Co., Summerlee, W. Va., to improve maintenance methods and increase safety.



A C-CLAMP used on small welding and cutting jobs in the shop utilizes material obtained from the scrap pile and consisting of ⅜x2-in strap iron, two ⅝-in Jeffrey pan-bolt nuts, a ⅝x7-in Jeffrey takeup screw from a 61 EW elevator and a large washer. These were welded together as illustrated to make a handy shop tool for speeding small jobs.

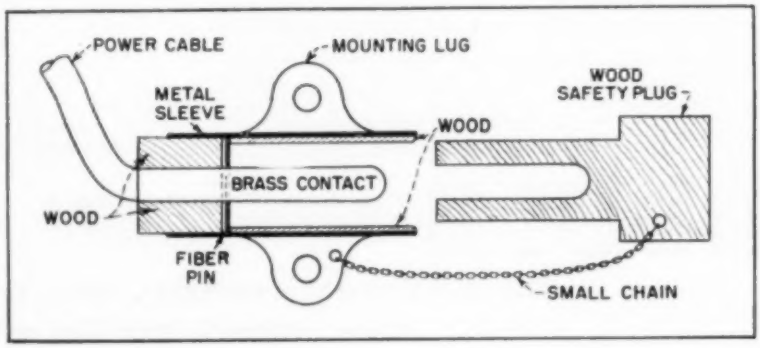


A TOOL made of a 24-in piece of scrap 1-in hexagonal drill steel welded to a 10-in rock wedge permits speedy removal of worn-out or broken armature shafts. After a cutting torch has cut the pinion to the key, the tool is placed between the motor housing and the pinion, and a large shop hammer is used to drive the pinion out. Usually a few light blows are sufficient.



REMOVAL OF A WORN VALVE SEAT from a Deming mine pump was a tough job until Mr. Lanier decided to do something about making the job easier. He went to the scrap pile, picked up a piece of old 3-in trolley-pole tubing, a piece of ½-in iron plate and a 1⅛-in hexagonal nut. The iron block, with the nut welded on top, was cut to fit inside a 2-in long piece of the tubing and welded flush with one end. The opposite end of the tube was cut to fit snuggly down into the valve seat. To remove a valve seat, the socket is placed in the proper position in the valve seat, a ratchet socket wrench is placed over the hexagonal nut and force applied. This new tool, made in 30 min, permits the repairman to do the job in half the time formerly required, Mr. Lanier reports.

A WOOD SAFETY PLUG inserted into a trolley-pole socket prevents workmen from putting metal bars in the socket and receiving electrical burns. They are used at Summerlee mine to insulate the power source to the unused pole of a two-pole locomotive. The trolley socket consists of a metal sleeve surrounding a wood insulator containing the brass contact leading from the power cable. A fiber pin binds the three parts together. The safety plug was made from a broken trolley pole and is attached to the socket with a small chain so it will not be lost when the pole is in use.



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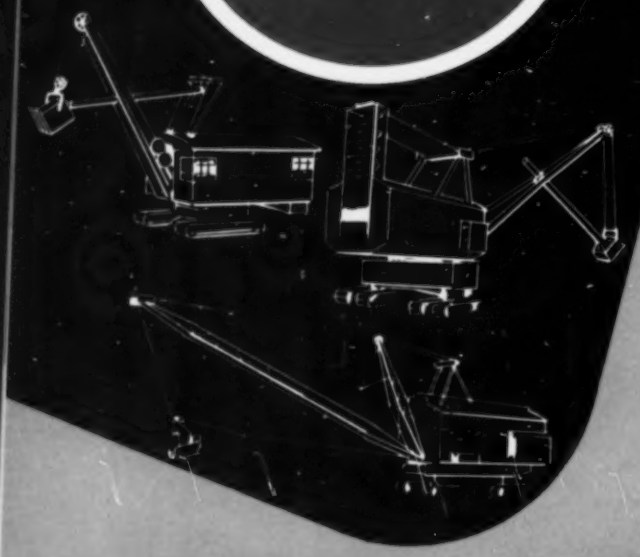
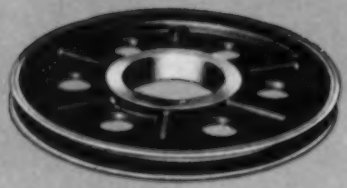


Hoist Gear & Pinion
Splined Pinion & Spider

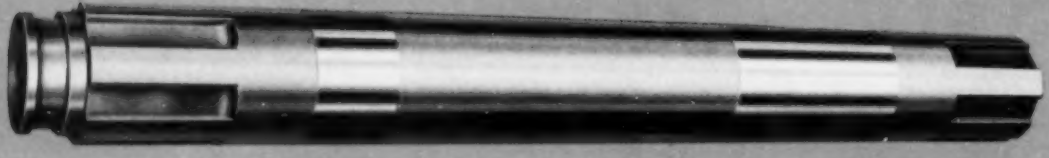


Sheave Wheel

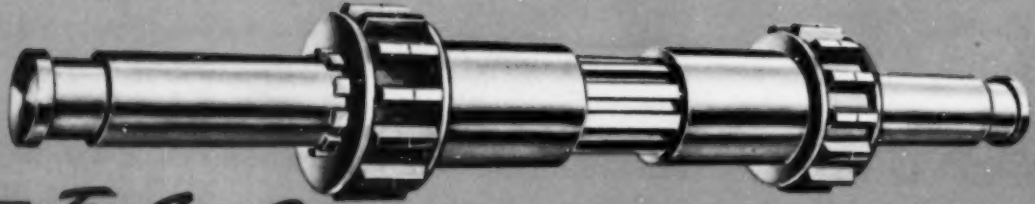
Bottom Roller

Second Intermediate Drive Gear

Lower Vertical Swing Shaft



Main Rotating Shaft



Shipper Shaft & Rack Pinion Assembly

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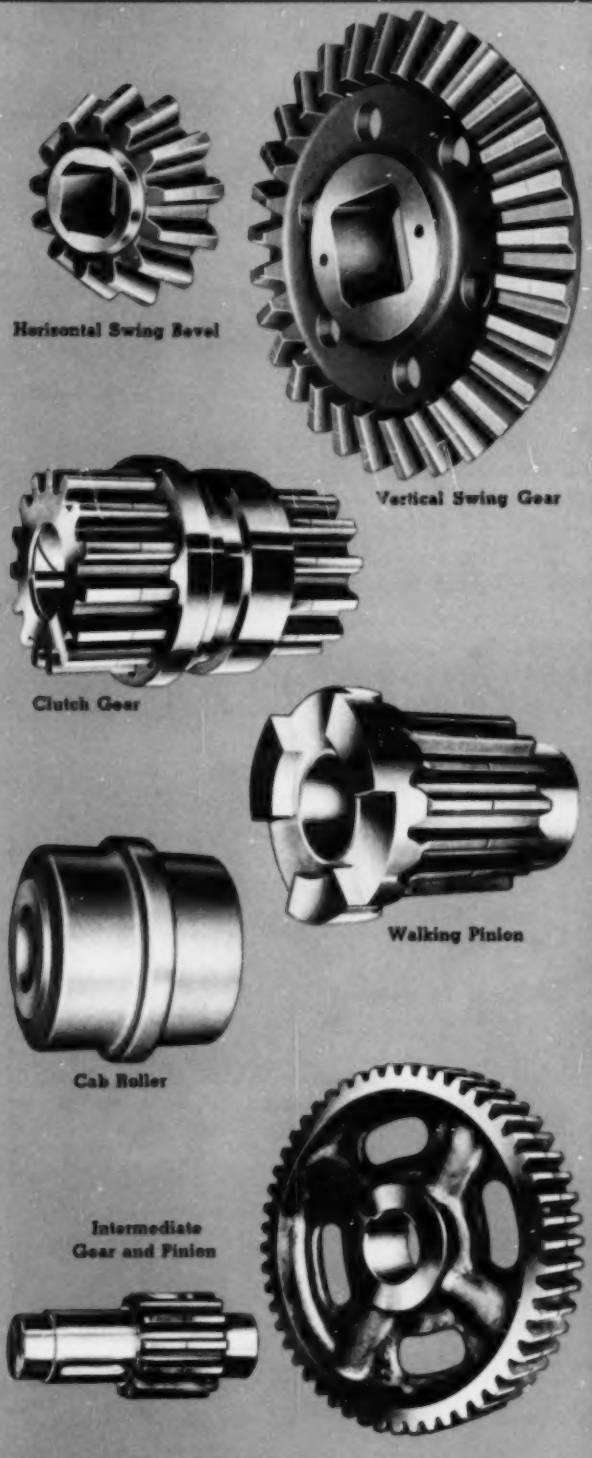
for strip mining equipment



last 2 to 5 times longer in the same service than parts formerly used

Actual installation records on file, prove long wearing "Tool Steel" parts are cutting downtime of expensive mining equipment to a minimum, resulting in appreciable production economies. To answer the increasing demand for "Tool Steel" Strip Mining, Shovel, and Drag line parts, we now maintain complete stocks of these items for immediate delivery.

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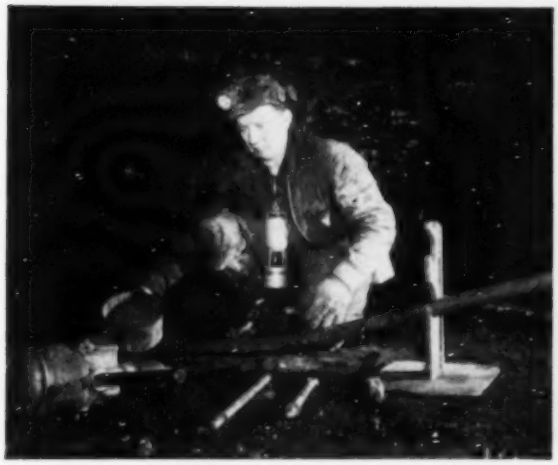
Lever-Held Unit Drills Hard Roof

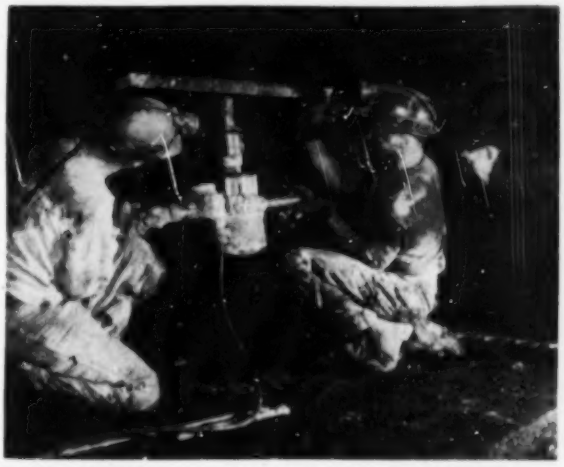


STEEL-PIPE LEVER and fulcrum applies pressure to conventional coal drill to permit drilling hard slate roof.

AN UNUSUAL ADAPTATION of a conventional coal drill to drilling difficult roof, particularly in low coal, recently has been developed by Anthony Shacikoski, general superintendent, Leechburg Mining Co., at the Park mine, Leechburg, Armstrong County, Pa. The idea is a variation of the lever and fulcrum and is used on a Jeffrey A-7 unit to drill a hard slate roof with a pebble streak about a ½ in thick running through it.

The forcing unit consists of a 6-ft double-strength steel pipe, 1½ in in diameter, which is supported by a specially made ¾-in steel-plate fulcrum. A pan is pivoted from the end of the pipe to steady and support the drill. To drill the first foot of hole, the pipe is put in the lower notch of the fulcrum. Then the pipe is placed in the second notch and the full 24-in hole is drilled.

By using this equipment and Kennametal HFD 1⅜-in bits the holes are drilled in about 1 min each, although formerly it was virtually impossible to drill this roof by rotary methods, Mr. Shacikoski reports. From 14 to 44 holes are drilled with the Kennametal roof bits before they became dull and the bits are expected to be good for up to six regrindings, it is understood. Another advantage of the set-up is that it permits the same crew to do the drilling and bolting, using the same drill for blastholes, roof-bolt holes and nut tightening and thus reducing equipment requirements.



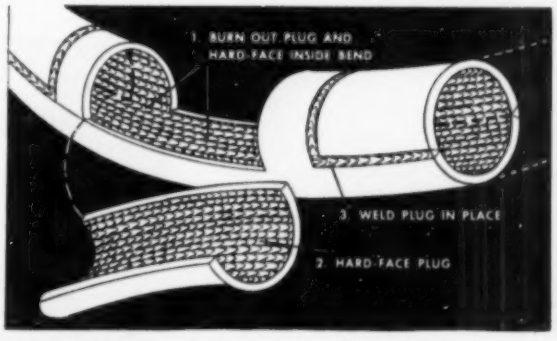
SAME CREW uses one drill to handle nut-tightening, coal and roof drilling.

How to Increase the Life of Solids-Carrying Pipe lines

PIPE SYSTEMS handling abrasive materials often are a troublesome maintenance problem as a result of cutting-out of the pipe wall where bends in the line occur, according to *Fusion Facts*, a publication of the Stoody Co., Whittier, Calif., manufacturers of hard-facing alloys.

One successful method for extending the life of pipe lines operating under these conditions is to burn out portions of the pipe to permit the application of hard-facing materials to the inside of the pipe, the article says.

As shown in the sketch, a plug is cut out of the pipe and the inside surfaces of both plug and pipe are hard-faced. Then the plug is welded back into place in the pipe. Sometimes, instead of placing a solid deposit, as shown in the sketch, it is better practice to ring the inside of the pipe with fairly high and properly-spaced circumferential beads. Acting as small dams, the beads will retain a certain amount of the material being transported in the pipe line, thus permitting the material itself to protect the pipe.



Since labor cost is the big item in welding, the Stoody people suggest that the higher initial cost of better hard-facing rod is economically justifiable.

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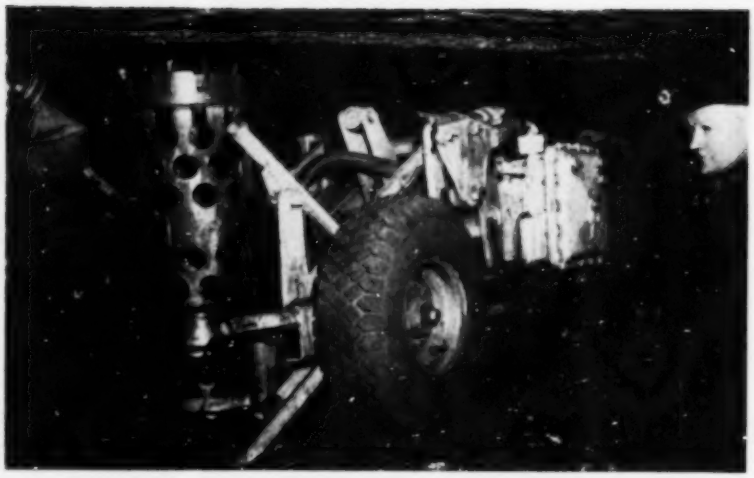
Overlying Roof Bolted Without Removing Bony

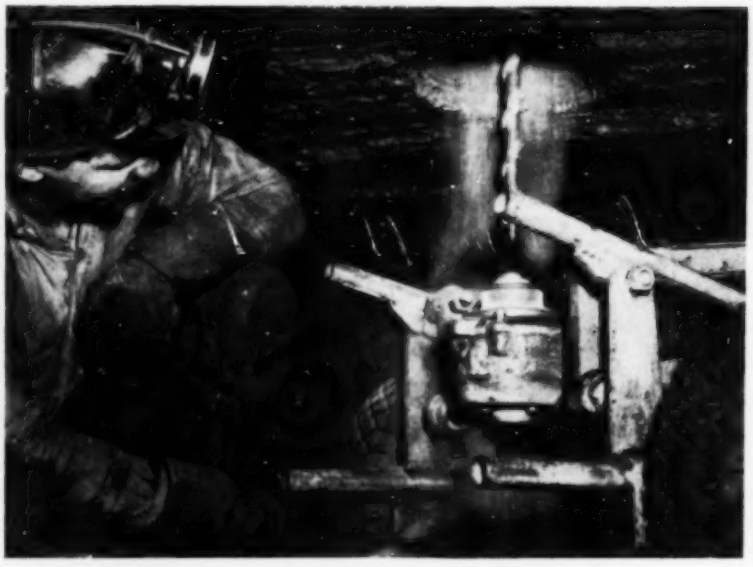
AN INGENIOUS METHOD of bolting the roof, while at the same time paving the way for the later removal of an 18- to 22-in-thick layer of bony coal under it, has been developed by officials of the Barnes & Tucker Co. at the Lancashire No. 20 mine, Elmora, Cambria County, Pa. Workings are in the Miller seam, 31 in thick, and the new method calls for both timbering and bolting.

In operation, the bony coal is first drilled in cylindrical shape using a Kennametal HCTS 9¼-in bit powered by a CP RDR 30 drill. Bolt holes are then drilled in the center of the cylindrical hole with a Kennametal HFD 1⅜-in bit and 42-in roof bolts with Ohio Brass ¾-in expansion shells are installed. A circular cap is placed on the bolt and the nut tightened. To complete the installation, the bony is timbered as shown in the accompanying photo. The entire operation is completed in less than 5 min.

A feature of the method is the ease of installing the 42-in bolts in this 31-in seam, points out Fred Leish, mine superintendent. To remove the bony coal as desired at a later date, it will be drilled, shot down and loaded out.



DRILLING LARGE HOLE in 18- to 22-in bony is . . .



FOLLOWED by 42-in bolt hole in solid roof and . . .

. . . TIMBERING of bony coal to be removed later.

Ashland

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3 ***PROVIDES A BETTER COAL FOR INDUSTRIAL USE . . .***

Many buyers of coal for lake shipment and stockpiling are asking that their coals be oil treated at the mines. In addition to eliminating the dust problem PERMATREAT Coal Spray provides other proven benefits.

Long shipments, extra handling and stockpiling has a tendency to cause segregation of fines, sogginess at bottom of the pile, making the coal unfit for many industrial uses. Oil treating holds the fines in suspension and assures a uniform coal at delivery point.

In lake shipment, especially, coals are subject to chemical and physical changes caused by air-borne moisture, wind and exposure to the elements. PERMATREAT Coal Spray coats the coal with a protective covering. There is less surface moisture absorption and coals retain their characteristics and bright appearance.

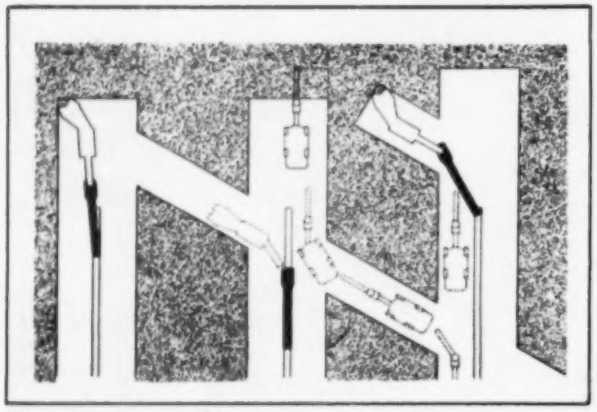
Users of industrial and metallurgical coals are quick to recognize the advantages of oil treating. Let us show you how PERMATREAT Coal Spray will make your coals more acceptable to these large users.

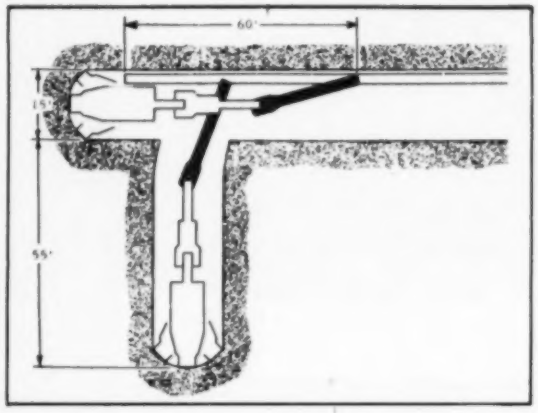
Ashland PERMATREAT COAL SPRAY

ASHLAND OIL & REFINING COMPANY

Ashland, Kentucky

Equipment News



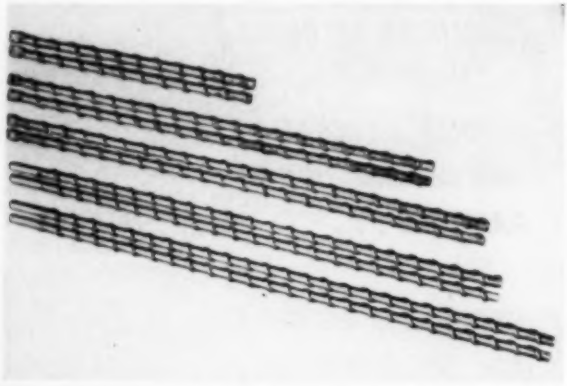


Bridge Conveyor Designed for Use With Heavy Loading Machines

New Long PT-15 Piggyback conveyor is recommended by the maker for use in high-capacity sections in conjunction with heavy loading machines which are capable of carrying the Piggyback while still retaining their swinging conveyors. The Goodman 660 and 865 and Joy 14-BU loaders are easily converted by installation of Long conversion parts for the swinging rear conveyor and power take-off, the company reports. Retention of the swinging conveyor is especially effective in maneuvering and working in close quarters and results in a longer combination loading unit that puts the tail piece of the room conveyor 40 to 45 ft back of the face, thus facilitating introduction of mobile cutters and roof-bolting units in conveyor sections, it points out. Use of the loader-Piggyback unit with a continuous-mining machine provides up to 115 ft of advance with a single pan-up, and also permits advance and breakthrough cuts with each conveyor extension, the company emphasizes. Bulletin 4004 with full details of Piggyback design and application for various conditions offered by Long Super Mine Car Co., Oak Hill, W. Va.

Portable Unit Crushes Coal in Pit

Profitable operation of its truck-mounted hammermill crusher in an Eastern Ohio strip pit, eliminating haulage and tipple handling, has been reported by the Eagle Crusher Co., Galion, Ohio. Used where coal quality permits crushing and immediate haulage to customers or railroad loading point, the unit is said to produce crushed coal in a wide variety of sizes as needed. Operation of the crusher by the shovel oiler permits manpower savings in addition to reduced haulage and handling requirements. More information available from Eagle Crusher.



Line Teams Bolting Augers and Drill Rods

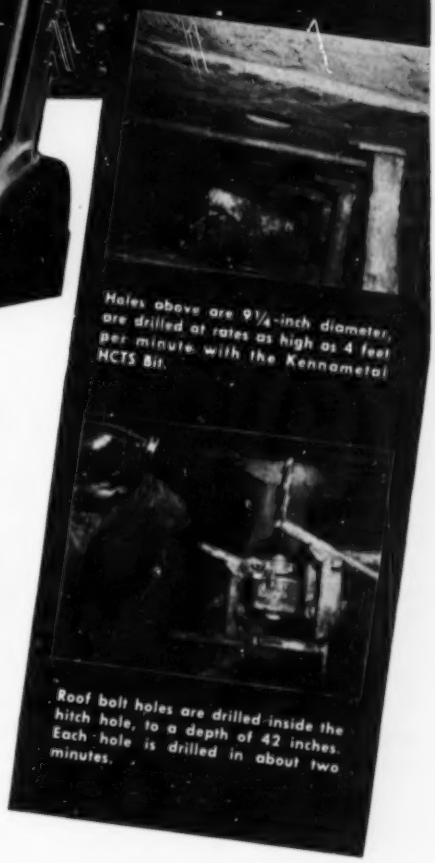
New team of Coalmaster "Roofbolter" augers and drill rods offer superior wear and break resistance for either wet or dry drilling, the maker says. Features cited by the company include one-piece non-weld construction that produces a tool with high durability and minimum loss from breakage; heavy-duty thick-wall seamless steel tubing made from high-tensile alloy heat-treated for maximum hardness; and non-clog Spir-L-Weld flight, an exclusive Coalmaster feature, said to eliminate jamming and clogging and make for faster drilling and clean accurate holes. Standard non-weld-type shanks are available for various drills, and sockets will accommodate any bit. Coalmaster Roofbolters are offered in standard lengths from 12 to 84 in. Full data from Central Mine Equipment Co., St. Louis 15.

PRESTO! 42-inch bolts in 31-inch coal

"Invisible bolting", made practical by Kennametal Sintered Carbide Bits, is solving a difficult problem at Barnes and Tucker's Mine #20, Bakerstown, Pa. In a 31-inch seam, roof must be bolted and about twenty inches of boney removed to assure continuous working safety and provide more head room.

Bolting operation requires only a few minutes. Holes 9¼ inches in diameter are drilled through the boney with a Kennametal Hitch Bit, then bolt holes are drilled 42 inches directly into solid roof. Bolts are installed through the hitch hole with the same rig that handles the drilling. Boney is immediately timbered, and later shot down.

Perhaps Kennametal Sintered Carbide Mining Tools — and your Kennametal Representative's experience and knowledge — can solve *your* tough cutting and drilling problems. Kennametal men will be glad to help, anytime.



Holes above are 9¼-inch diameter, are drilled at rates as high as 4 feet per minute with the Kennametal HCTS Bit.

Roof bolt holes are drilled inside the hitch hole, to a depth of 42 inches. Each hole is drilled in about two minutes.

KENNAMETAL®

KENNAMETAL INC., MINING TOOL DIVISION
BEDFORD, PA.

General Offices and Main Plant at Latrobe, Pa.

World's Largest Manufacturer of Tungsten-Carbide

Drill Bits, Cutter Bits, Roof Bits, Strip Bits

Track-Type 2-Yd Shovel for High Mobility

Its first highly mobile track-type shovel of 2-yd capacity has been announced by the Caterpillar Tractor Co., Peoria 8, Ill. Called the No. 6 shovel, the machine is designed to provide the best possible digging, lifting and dumping characteristics and has a dumping height of 10 ft 9 in and a reach of 3 ft 5 in. It is powered by a 66-drawbar-hp crawler on a non-oscillating track frame and is an integral unit with the tractor shovel frame bolted and welded at widely separated points. The design features excellent balance and stability, five gears forward and four in reverse, unobstructed operator visibility and an abrasive-resistant layer-plate bucket, the maker points out. Catalog Sheet 1823-239-A with details available from Caterpillar Tractor or its dealers.

Two High-Speed Scrapers Broaden Use

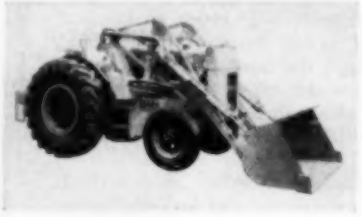
New high-speed self-propelled Wooldridge Terra Cobra scrapers, the TH-B90 with a heaped capacity of 11 cu yd, and the TH-B110 (shown) with a heaped capacity of 13 yd, have been announced by the Wooldridge Mfg. Co., Sunnyvale, Calif. Developed to offer a complete range of capacities, both the new rubber-tired models are said to incorporate the same basic design and operating features as the larger 17.5-yd Standard 142 Series, including positive hydraulic steering, air-operated power control, "boiling-bowl" loading, positive roll-out ejector, heavy-duty construction and high maneuverability. Models TH-B90 and TH-B110 are equipped with 150- and 180-hp Cummins diesel engines and have struck capacities of 9 and 11 cu yd, respectively. Full data from Wooldridge.

HYDRAULIC CONTROL HOSE

New line of high-pressure hydraulic control hose developed by Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, is said to be capable of withstanding pressures up to 5,000 psi and is reinforced with fine high-tensile steel wire to give maximum flexibility and burst resistance under shock loads, at temperatures from minus 40 to 250 F. The rubber tube is especially compounded to resist all popular hydraulic fluids, and the cross-wrapped rubber cover protects the carcass against weather, mildew, oils, greases and fumes, it is said. It is available for both high-pressure and medium high-pressure use, in sizes from 3/16 to 2 in inside diameter.

NEW-TYPE AIR SPRING FOR TANDEM-AXLE TRAILERS

A new air spring designed to keep the floors of trailers parallel to the axles regardless of shifting loads, misloading or high-crown roads has been announced by the General Tire & Rubber Co., Akron, Ohio. Key feature of the unusual-design spring is automatically controlled air pressure in each of the unit springs that keeps the trailer riding at the same height whether empty or fully loaded. Now made for tandem-axle trailers, the design is currently being adapted for single-axle trailers, tractors, trucks and busses. The new development offers longer tire life through controlled ride and positive braking action, plus a substantial reduction in truck operating and maintenance costs, General Tire reports. Vehicle weight and load are evenly distributed over 5½ ft of the frame rather than at specific points, and high-frequency vibration is sizably reduced. Because of the spring's light weight, payloads can be increased appreciably, it is said. Bulletin 3882 with full details available from the company.



BUCKET LOADER

Designed to speed bulk materials handling in a variety of applications, the Baker-Lull Shoveloader is a multiuse hydraulic loader available with eight accessory attachments, and is said by the maker to have up to 66% more lifting power. Available in six models, the Shoveloader is mounted on four national makes of industrial tractors: Case, Minneapolis-Moline, Shepherd and Oliver. Basic attachment is a material bucket, and others include a combination coal-and-snow bucket, bulldozer, lifting crane, sweeper, rear-leveling blade scarifier and logging fork. More data from Baker-Lull Corp., Minneapolis 20, Minn.

20-TON DUMP BODY

The "Morgantown," a new 20-ton-capacity tandem-axle straight-bed dump body announced by the Galion Allsteel Body Co., Galion, Ohio, is constructed of 10-gage steel with a full-size cab protector and has an over-all body length of 20 ft. The body is amply reinforced by six steel V-type braces and has a double-acting tailgate 35 in high, with cast-steel and malleable-iron heavy-duty hardware. Dumping is handled by a Galion Model 77353 hoist, consisting of two 7-in twin-ram 3-stage twin-telescopic cylinders rated at 20 tons. Details from the company.

B.F.Goodrich

Ira Zeigler, truck driver for Pittshaw Trucking Co., examines the tread of a BFG Rock tire on his semi-trailer.

"Better than any tires we've ever used," says coal hauler about BFG tires

THE Pittshaw Trucking Co. hauls coal from strip mines near Kittanning, Pa., to loading tipples eighteen miles away. Sixty-seven company trucks, tractors and trailers cover the distance under giant loads of coal—over rough, rock-strewn roads and often over no roads at all.

Here, certainly, is a chance for off-the-road tires to prove they can take rugged operating conditions and still give positive traction and long wear. "Without doubt," says Pittshaw Supt. Richard McGarvey, "B. F. Goodrich tires have proven to be better than any tires we have ever used." This is why Pittshaw's units are 98% equipped with BFG tires.

The Rock tires above are used on semi-trailers carrying extra-heavy loads. Husky cleats in the shoulders of these tires take non-slip bites in both forward and reverse. And Rock tires are built with the exclusive nylon shock shield. Layers of strong, elastic nylon cords stretch together under impact to absorb and distribute shocks and bruises, protect the tire body. You get this 4-way saving:

(1) more recappable tires and more hours of service per recap (2) more original hours of service (3) increased bruise resistance (4) less danger of tread separation. All these advantages, yet the nylon shock shield costs you nothing extra. It's found in all tires of 8 or more plies—*double* nylon shock shield in larger sizes.

See the complete line of cost-cutting tires at your BFG retailer's store. You'll find the address under Tires in the Yellow Pages of your phone book. Or use the coupon below.

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

The B. F. Goodrich Co.
Dept. TO-58, Akron, Ohio

Please send me:

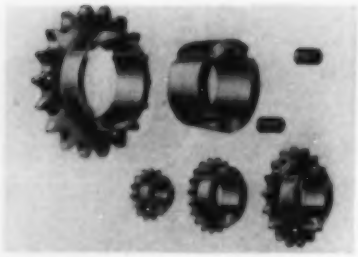
- ☐ name of my nearest retailer
- ☐ free catalog on off-the-road tires
- ☐ free book, "How to get more recaps out of truck tires".

Name_____

Company_____

Address_____

City_____ Zone____ State_____



ROLLER-CHAIN SPROCKETS

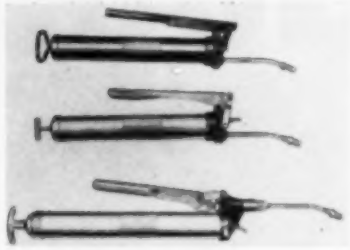
New line of Taper-Lock stock roller-chain sprockets, added to the present line of Morse-stock plain-bore sprockets offer the advantages of immediate "off-the-shelf" availability to meet the requirements of most industrial applications, while eliminating the delay and extra expense of reboring to fit shafts. Taper-Lock sprockets are keyed to shafts for easy, quick installation and removal, yet grip shafts with the firmness of a shrink fit, thus eliminating the need to turn and grind shafts to get a tight fit, the maker says. Morse Taper-Lock Sprockets fit any roller chain manufactured to American Standards, Nos. 40 through 100, and will be stocked in ½- to 1¼-in pitch. Details from Morse Chain Co., Detroit 10, Mich.

AUTOMATIC SAMPLER

The new design of the Denver automatic sampler for wet or dry sampling eliminates complicated wiring circuits and uses only one limit switch. All wiring is enclosed in flexible conduit, and time switch and all terminal connections are in one enclosure. A gear motor operating only at intermittent intervals is controlled by motor-driven time switch which may be easily set for intervals varying from 2 to 55 min, in 1-min intervals. A positive-drive roller chain moves the cutter assembly on ball-bearing wheels along the carrier track and standard cutter travel is 21 in. Full data from Denver Equipment Co., Denver 17.

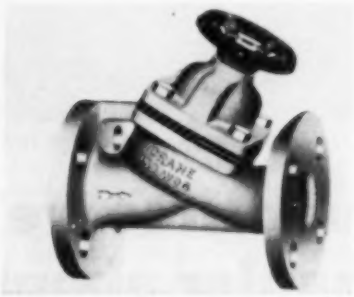
NEW-TYPE STORAGE BATTERY

New materials and structural changes have been utilized to provide 20% more capacity in the same space in the new line of T-H Exide Ironclad batteries, according to The Electric Storage Battery Co., Philadelphia 2. The new battery, which is essentially the Exide Ironclad using the exclusive slotted-tube positive plate, features long service life and dependability in addition to the higher capacity, the maker reports. Full details from Exide.



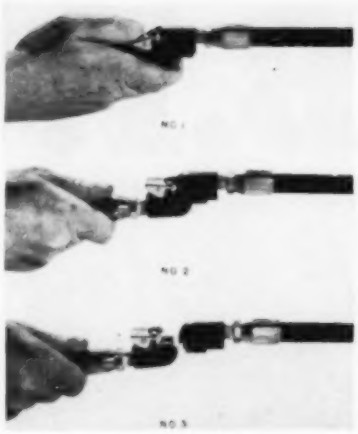
GIANT-SIZE GREASE GUNS

Four new Lincoln giant-size lever-type grease guns are said by the maker to hold 40 to 100% more lubricant than ordinary grease guns, cut down refilling time and eliminate hoses. They can be refilled in seconds from a Lincoln filler pump without mess or waste and may also be filled by suction. The four models available include two 21-oz-capacity guns developing 10,000-lb pressure; a 32-oz gun, with 10,000-lb pressure; and a 32-oz volume-type gun, developing 4,300-lb pressure. All have a long hydraulic-coupler extension for ease in contacting hard-to-reach fittings and a filler nipple for refilling guns from a filler pump. Complete details in Bulletin 718 from Lincoln Engineering Co., St. Louis 20, Mo.



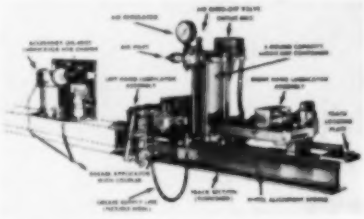
PACKLESS DIAPHRAGM VALVES

With the addition of several new body, diaphragm and lining materials to the Crane line of packless diaphragm valves, the valves are now regularly available with cast-iron, brass, aluminum, or 18-8 Mo bodies and disk holders; and with diaphragms and disk inserts of Neoprene, Buna-N, and soft natural hard rubber linings. Specially prepared vaives for vacuum, oxygen and acetylene service also are now regularly available. Outstanding feature cited by the maker is the separate diaphragm and disk construction. Since the diaphragm is not used for seating, it is not subjected to the cutting, crushing and abrasion that lead to rapid wear. Closure of the independent disk will prevent escape of line fluids even if the diaphragm should fail. Sizes and data from the Crane Co., Chicago 5.



FLUID-LINE CONNECTION

New Aeroquip Slide Seal coupling is said by the maker to permit instant connection and disconnection of fluid-carrying lines by a simple push-pull action. Pressing the lock lever separates the coupling halves and starts the disconnecting action which is completed by a light pull. When fully disconnected, each half forms a perfect seal. Aeroquip Slide Seal couplings may be used with a wide range of fluids, such as hydraulic, water, hot oil, crude and fuel oils, anti-freeze solutions, gasoline, diesel fuels, air and others, the company says. More details from Aeroquip Corp., Jackson, Mich.



CONVEYOR TROLLEY WHEELS LUBRICATED AUTOMATICALLY

Lubrication of conveyor trolley wheels, usually either neglected or done by hand with resultant conveyor stoppage, waste of manpower and lubricant, and risk of injury, is now automatic with the new Alemite lubricator that delivers a pre-set constant shot of either oil or lubricant to each trolley wheel on each side of the conveyor system, simply by the flick of a switch, the maker says. The entire unit is contained on a section of I-beam 37¾ or 40 in long fitted into the conveyor track at any convenient spot within reach of an air line and a 115-V 60-cycle connection. As each wheel reaches the spot on the track where the lubricator is installed, a coupler clamps the lubricant fitting on its hub and delivers the required amount of lubricant or oil at a pressure of 800 to 1,000 psi. When all wheels have been lubricated, the system is switched off and is ready to resume operation at any time. Full data from Alemite Div., Stewart Warner Corp., Chicago 14.

YOU hold the watch!

If you want to know whether you're getting the most out of your earthmoving rigs, here's how to find out.

On your own job, under any conditions you choose, *time* the work cycle of a Cat* DW21 Tractor and No. 21 Scraper against any other make of similar equipment. Or, if you're using four-wheel tractors, make the same comparison with a DW20 or a DW10 unit. Check the yardage handled in an hour—or a day.

We have enough confidence in the big yellow Caterpillar rigs to believe they'll sell themselves in any such test. And your dealer is ready to give you a demonstration. Fair enough? Call him today.

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR*

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

...ride a "JEEP"

The Lee-Norse TJ1 Mine Jeep gets you there safely! Here's the best answer for speedier underground transportation to and from working faces and emergency areas for mine superintendents, engineers, inspectors and maintenance personnel. A versatile performer the Lee-Norse Jeep can be used to pull man-trip cars, fire-fighting equipment and can be quickly placed in service as an ambulance. Detailed data available on request. Write now!

...ride a "SCOOTER"

No reason for mechanics, pumpers, fire bosses and other maintenance personnel to lose valuable time hitch-hiking when there is a Lee-Norse Scooter at hand. Weighing approximately 1000 lbs., the Scooter is popularly priced and its low-operating cost fits into every mine budget. The Scooter has a 48" wheelbase, is 9' in overall length and is available in all track gauges from 36" to 48". Where time is a factor the Lee-Norse Scooter is a "must". Send today for complete information and prices.

Lee-Norse Company
CHARLEROI, PA

ENCLOSED TROLLEY SYSTEM

Newly announced U-S Safety trolley system is applicable wherever current collectors are used, such as for traveling cranes, mine and power applications, portable electric tools and many other uses, the maker reports. The system features an inexpensive and highly efficient collector which can carry loads from 50 to 2,000 amp, a conductor enclosed within an insulating sleeve split at the bottom to provide for entrance, and a trolley shoe supported on a ball joint for flexible action. The shoe is made of copper alloy that matches the conductor, the latter serving as a guide track as well as the means to conduct current. Bulletin with technical and installation data offered by Universal-Standard, Inc., Pittsburgh 28.

ROLLER CHAIN ASSEMBLY

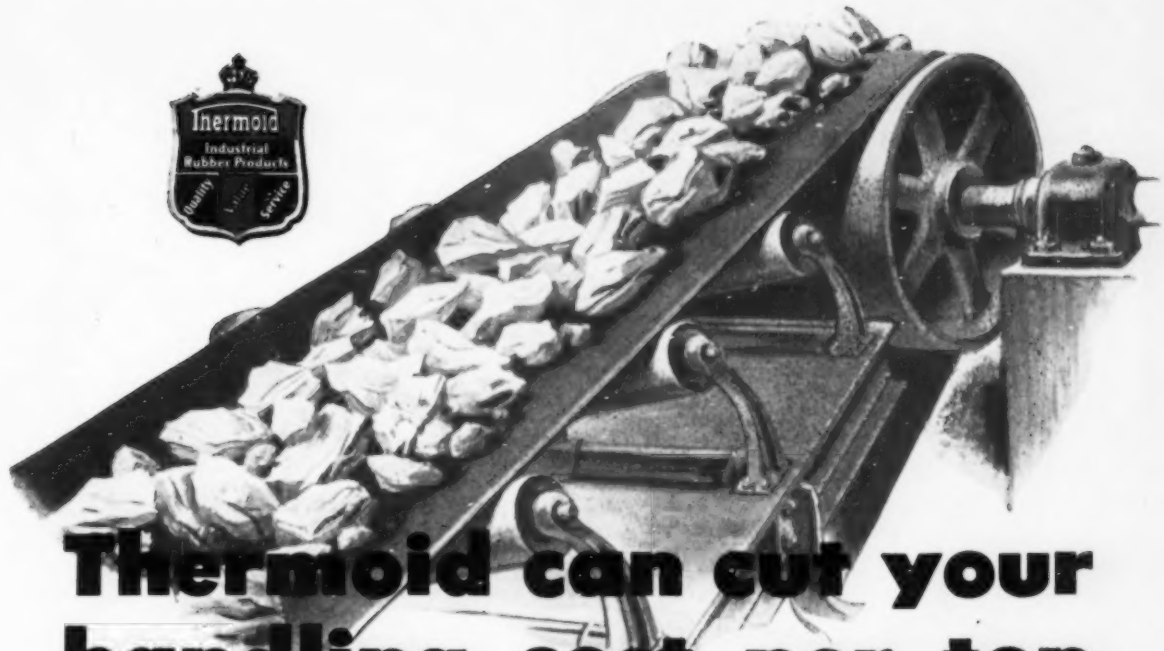
Designed to cut downtime from chain failure and replacement, an improved, easy-to-assemble riveted roller chain combines the long-wearing characteristics of riveted roller chain and the ease of assembly and disassembly of cottered chain. Called the Improved Baldwin Assembly riveted roller chain, it is supplied in ASA standard and heavy series, 1- through 2½-in pitch sizes in multiple widths, made up to 10-ft lengths with an exclusive Baldwin-Rex single-pin coupler installed at the most convenient intervals. The spacing of the couplers varies, depending on the chain size, but they are placed in the assembled chain so that any length can be made up without cutting rivets or damaging parts. Bulletin 52-2 with detailed information offered by the Baldwin-Duckworth Div., Chain Belt Co., Springfield 2, Mass.

TRACTOR CABLE CONTROL

Especially designed for use with tractors of 130 hp or more, new Wooldridge Model WD-2 extra-heavy-duty cable-control unit is said to employ a simplified power train comprised of only one worm gear and wheel. Double drums of 10-in barrel diameter are actuated by multiple-disk clutches and large surface self-energizing brakes for fast, smooth action under all operating conditions, and full universal fairleads and large sheaves provide longer cable life and easier reeving, the maker reports. The unit is designed for use with Caterpillar D-8, Allis-Chalmers HD-20 and HD-19, and IH TD-24, and may also be adapted to certain other large tractors. Bulletin from Wooldridge Mfg. Co., Sunnyvale, Calif.

TRACTOR POWER CONTROL

A new power-control unit designed for high capacity and easier control, with adequate line pull for even the most severe operating conditions, has been announced by the Baker Mfg. Co., Springfield, Ill., for use on Allis-Chalmers HD-15 and HD-20 tractors and others of comparable horsepower. The new rear-mounted Baker unit, the PCU-75, combines a multiple-disk clutch with a sturdy simplified brake design. The new Baker clutch actuates within a shorter distance, and can be engaged or disengaged with a



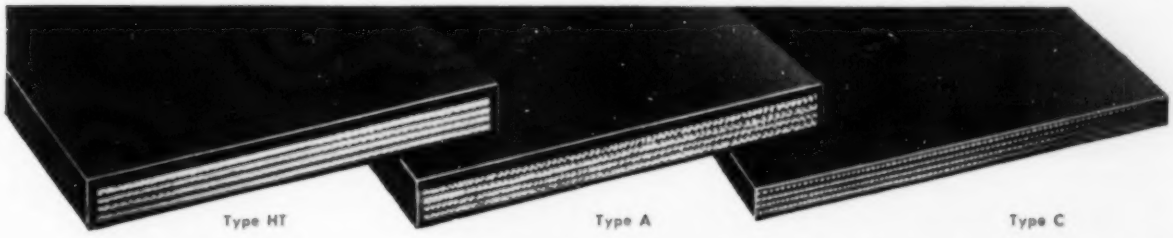
Thermoid can cut your handling cost per ton

Regardless of the weight, abrasive action or temperature of the materials you handle, there's a Thermoid Conveyor Belt that will stay on the job longer, reducing your handling cost per ton.

Thermoid Conveyor Belting for mining, quarrying or heavy construction work is designed for maximum service in these specific uses. Strong cotton fabrics, thoroughly impregnated with high test rubber friction, are combined with tough, wear-resistant rubber covers. Welded together under extremely high pressures to assure exceptionally strong, durable belting.

Your Thermoid Distributor can help you select the belt best suited to your needs. If your problem is unusual, he'll call an experienced Thermoid Sales Engineer.

Thermoid Belting specifically designed for mine, quarry and construction work:



For highly abrasive granite, flint rock, quartz ore, etc.

For slag, lime rock, crushed stone and hot material.

For sand, gravel, loam and finished cement.

Write for Thermoid Conveyor Belting Catalog #3679, containing full engineering data.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

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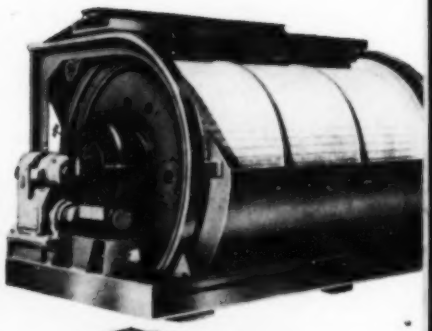
Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

All over the nation

PETERSON TFR *and* DISC VACUUM FILTER INSTALLATIONS



During the last ten years a rapidly growing number of coal and metallurgical engineers have been turning their TOUGH FILTRATION and DEWATERING problems over to Peterson. They have learned that Peterson's engineering know-how, gained through 37 years of filtration experience, produces filter equipment to fit their exact needs.

That's why the installation map of this relatively new — but thoroughly seasoned firm of filtration specialists, is always out of date. Tough problems continue to arise and Peterson solves them.

If you want dry, fluffy cake from your coal fines — the lowest moisture with minimum degradation, get in touch with Peterson today. There is no obligation, but you'll profit when you take advantage of our experience.

PETERSON FILTERS & ENGINEERING CO.

Office and Laboratories: 137 MOTOR AVE., SALT LAKE CITY 1, UTAH

37 YEARS OF INDUSTRIAL FILTRATION EXPERIENCE IS AT YOUR DISPOSAL FOR THE BEST IN FILTER INSTALLATIONS

lever travel of only 5 in, the maker says. The simplified brake design permits faster braking and faster release action, and is easier for the operator to control, it is said. Full details from Baker or Baker-Allis-Chalmers dealers.

SPLIT-CASE PUMPS

For supplying, circulating and boosting water and clear liquids at medium and high heads, with special emphasis on performance and long service life rather than low initial price, Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles 31, has recently completed the modernization and consolidation of a complete line of 2-, 3-, 4- and 5-stage split-case pumps. Designated as its Type TU line, the pumps are offered in 2-stage designs with capacities up to 3,000 gpm and heads to 800 ft; 3-stage units for heads to 950 ft and capacities up to 1,400 gpm; 4-stage, 1,600 ft and 900 gpm; and 5-stage, 1,550 ft and 300 gpm. Bulletin 1400 with complete specification and application data offered by the company.

AUTOMATIC LUBRICATOR FOR SINGLE MACHINES

New small low-cost Farval DC-20 automatic pumping unit is designed to provide the same trouble-free dependable automatic lubrication for single machines as obtained with centralized lubricating systems. Features cited by the maker include accurately metered lubricant without waste or spillage; positive frequency control; completely automatic independent time-clock control; extended bearing life; and less downtime. Available in six sizes. Bulletin 39 with full details from Farval Corp., Cleveland 4.

SAFETY SWITCHES

A new line of standard-duty safety switches announced by the Trumbull Electric Dept., General Electric Co., Plainville, Conn., includes ratings of 30, 60, 100 and 200 amp, 240 and 600 v, 2, 3 and 4 poles. Known as the Standard Duty HCI, this safety-switch line is designed to meet all but the most severe operating demands, incorporating a pole unit which is, in effect, a self-contained switch, the maker says. It features quick-make quick-break action, interlocking cover and horsepower ratings, and meets NEMA Type A Standards.

Equipment Shorts You'll Want to Check

CUTTING GUIDES for individual gas-flame metal-cutting torches are designed to provide simple, low-cost attachments that permit accurate cutting of circles, straight lines, bevels and sundry shapes with no special training or skill. As emergency or standby equipment, they are said by the maker to provide a means for quickly producing parts that would ordinarily take days if ordered from an outside source and also permit

Smoothing the Patter of Great BIG Feet
Dragline builders find one of their knottiest engineering problems in easing surges and shocks, while "walking" the ponderous machines.
In the 700-ton, 12-yard Monighan Dragline—owned by Pittsburgh & Midway Coal Mining Co., Hallowell, Kansas—the "walking" problem was solved by a Twin Disc Disconnecting Hydraulic Power Take-Off installed between the Caterpillar D 397 engine and the speed reducer, to actuate the two gigantic "feet."
"With the Disconnecting PTO," says Mr. Ed Phelps, General Superintendent of Pittsburgh & Midway, "the cyclic surges have largely disappeared. We're moving the machine considerably faster, and the shock absorption of the coupling gives us a higher work rate with less maintenance than with straight mechanical drive."
For complete data on Model HUD and other Twin Disc Hydraulic Drives, see your nearest Twin Disc Hydraulic Dealer—or write Twin Disc Clutch Company, Hydrauiic Division, Rockford, Illinois.
Twin Disc HUD Disconnecting Hydraulic Power Take-Off acts as both shock absorber and cut-off clutch—speeds movement and ups yardage by 10% on this walking dragline. HUD's (see cross section lower left) are available in sizes 21 and 27" for 60 to 600 hp engines.
Built for a Long Life . . .
Backed for a Lifetime
TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
TWIN DISC CLUTCH COMPANY, Racine, Wisconsin : HYDRAULIC DIVISION, Rockford, Illinois
BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

ON THE WEIGH!

TO GREATER EFFICIENCY

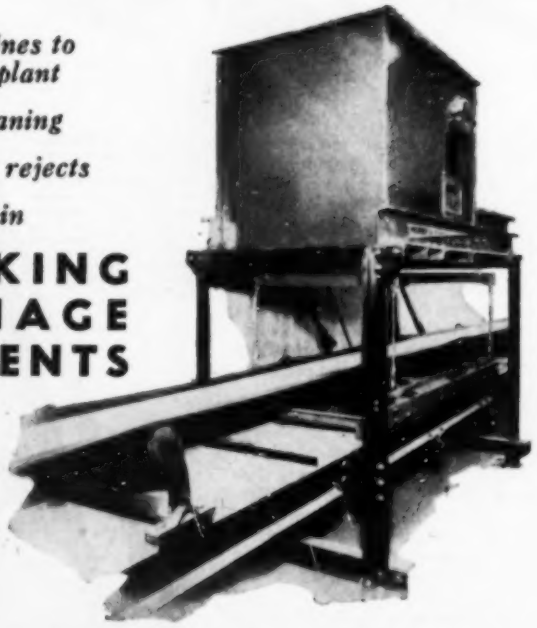
1 *From mines to washing plant*

2 *After cleaning*

3 *weighing rejects*

and in

CHECKING TONNAGE PAYMENTS



Modern Coal Handlers Need the

WEIGHTOMETER

Yes! All these features can be yours with a Merrick WEIGHTOMETER*—Accurate weight records mean lower production costs—Leading coal producers use the WEIGHTOMETER for continuous weighing while conveying—No interruption to conveyor service—Applicable to existing belt conveyors or furnished complete with short belt conveyor—Instruments for remote recording and permanent production records available—Write today for Bulletin 375 for further details.

• AND THERE'S ALSO THE FEEDOWEIGHT

The FEEDOWEIGHT* provides absolute control in the blending and proportioning of coal——Widely used in coking plants for accurate blending of coking coals by weight—Write for Bulletin 551 for further details.

*** Reg. U.S. Pat. Off.**

MERRICK SCALE MFG. CO.
173 Summer St., PASSAIC, NEW JERSEY

marked economies when the production of only one or a few parts is required. Made in styles to fit all makes of torches in three types, the guides can be attached ready for use in 2 or 3 min. Full details from New Era Engineering Co., Chicago 16.

CUTTING up of 2¾-in-diameter steel rod in 13 sec, new Model 25-EE suspension-type Guillotine provides a 150-ton thrust with relative mobility. It is also adaptable for riveting cold rivets up to 1 in and for punching and pressing and is particularly advantageous where taking the tool to the job is desirable, the maker points out. Complete data from Manco Mfg. Co., Bradley, Ill.

FOR OUTSIDE YARD WORK, Baker-Lull universal loader is said by the maker to be highly effective for a materials-handling work in snow, mud and rough terrain and combines a tilting service a wide range of industrial retower with 10 handling attachments to quirements. The universal loader is available in three models up to 6,000-lb capacity and mounts on four national makes of industrial tractors. It is sold with the following attachments: adjustable lifting forks, coal, snow and material buckets, bulldozer blade, reversible angledozer blade, crane-lifting hook, V-type snow plow, lifting platform and gas-powered sweeper. Literature from Baker-Lull Mfg. Co., Minneapolis 20, Minn.

ROOF VENTILATORS — Chelsea Type RVD and RVB heavy-duty high-velocity roof ventilators for industrial use feature inconspicuous and weather-tight construction. Primarily used as exhaust fans, they can easily be adapted for fresh air supply and the automatic built-in louvers acting as an effective back-draft damper may be installed at base if desired. Available in 12- to 48-in sizes, 1,300 to 20,000 cfm free air. Bulletin 511 from Chelsea Fan & Blower Co., Inc., Plainville, N. J.

FASTER ADDING with figures added and printed automatically as they are entered on the keyboard is featured in new National "Live" Keyboard adding machine, said by the maker to cut out up to 50% of previous hand motion. Until now, all electric adding machines operated in two steps: (1) set up the amount and (2) depress the motor bar. The National "Live" Keyboard eliminates that second step. Full information from The National Cash Register Co., Dayton 9, Ohio.

SPECIAL TRUCK that eliminates the usual excessive physical exertion in opening and closing bottom gates in hopper cars is one of the many specially designed vehicles produced by the Elwell-Parker Electric Co., Cleveland 3. With the unit, one man can do the job effortlessly, safely and economically in a fraction of the time formerly required for two men, the maker says.

4-WHEEL SCRAPERS to fit every job and every crawler tractor, including

New Sinclair Grease for Heavy Duty Equipment

Tests prove New Grease Gives better Lubrication... Longer Life to Bearings

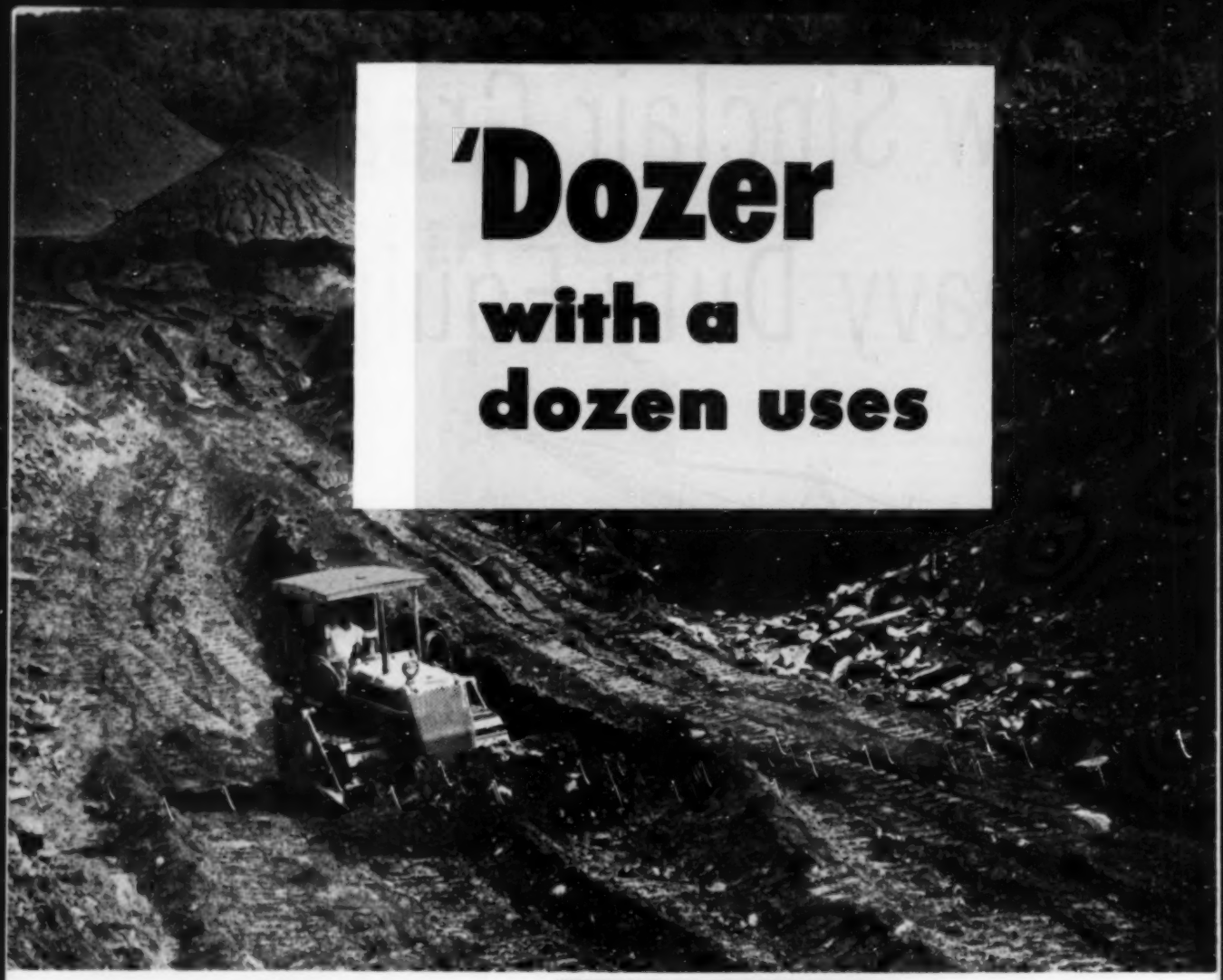
A new Sinclair grease with superior lubricating qualities for bearings of heavy duty equipment is now available. Sinclair HEAVY DUTY BEARING GREASE is specially compounded to *stay put* in heavily loaded, slow speed rotating or sliding bearings.

New Sinclair HEAVY DUTY BEARING GREASE has an exceptionally high load-carrying capacity... greater resistance to pounding and shock loads... greater resistance to melting out. Operators of power shovels, draglines, tipples, conveyors and all other heavy duty equipment are assured of longer bearing life... higher productivity... lower operating costs.

Sinclair HEAVY DUTY BEARING GREASE is available in three grades – "0," "1," and "2." It is easily applied with a hand gun or air gun. It comes in 35 pound pails and 100 and 400 pound drums.

A Sinclair Lubrication Engineer can give you expert counsel on how you can get the most out of Sinclair's new HEAVY DUTY BEARING GREASE. Phone your local Sinclair Representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR HEAVY DUTY BEARING GREASE



'Dozer with a dozen uses

Any Caterpillar 'Dozer will more than pay its way around a mine. This D2-No. 2A Bulldozer used by Michael Stefero in reclaiming bank coal at Boston Run, Pa., is a good example.

Smallest bulldozer unit in the Caterpillar line, the D2-No. 2A is built with the same rugged strength as its big brothers, and powered by the same type of dependable Cat Diesel Engine.

Among the jobs that can be handled by this unit are general 'dozing on the bank and in the pit, feeding the loader, cleaning up around shovels and draglines, road construction and maintenance, and drainage work. The hydraulically controlled angling blade adds to the versatility of the machine. And its simplicity and handling ease win the praise of operators.

Your Caterpillar Dealer has a full line of sturdy Cat Bulldozers, matched to all tractor sizes. He'll be glad to demonstrate the unit you need. And he'll back its long work life with prompt service and genuine Caterpillar parts.

CATERPILLAR, PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

USE THIS CARD ➧

. . . TO GET BULLETINS or more information on new products.

YES—I would like more information . . .

Please send me the catalogs or further information on the new products listed here (Give manufacturer's name, product name, catalog number or title for each). **(May, 1953)**

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THE EDITOR, COAL AGE

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NEW YORK 36, N. Y.

capstan is rotating. Full details from St. Anthony Machine Products Co., Minneapolis 6, Minn.

MOTORIZED CARD FILE is a large-capacity master file unit handling existing records of every type in all standard card sizes, address plates or other items. No other device can deliver so many cards per second than the Master File. Cards are set in individual 8-in trays holding 800 cards each and any card may be easily read without being removed. There are from 4,000 to 17,500 cards always open before the operator within half-an-arm reach. Folder on Models 45 and 60 offered by Ferris Business Equipment, Inc., Stratford, Conn.

ELECTRODE – Stoody Build-Up has been developed to provide the exact properties necessary in a material used for rebuilding carbon-steel and alloy-steel parts – sound deposits, high tensile strength, toughness and resistance to cold flowing. As an underbase it is generally recommended for such parts as drive sprockets, churn drills, shovel-drive tumblers and house rolls, tractor rollers and idlers, tool-joint shoulders and clutch jaws. Details on this extruded alloy-coated electrode designed to produce an alloy-steel deposit of consistent medium hardness of 29-31 Rockwell C under normal conditions offered by Stoody Co., Whittier, Calif.

COMPRESSED-AIR FILTER—Hankison Corp., Pittsburgh 16, has announced its new Model A-100-D Condensifilter, a unit to filter and dehydrate compressed air that uses an entirely new type of disposable filter cartridge said to provide even greater economy of operation, offer 37% more filtering area, eliminate costly shut-downs and reduce maintenance to a matter of minutes. Under normal working conditions, the unit will operate 5 to 6 mo without renewing the filter, the maker says. Bulletin available.

COMPLETELY MECHANIZED ACCOUNTING, including full description of entries, has now been brought well within reach of almost every business budget by the development of the new Remington Rand "Low-Cost" bookkeeping machine, the maker says. Delivered with typewriter keyboard and a minimum of five registers, the Low-Cost can be amortized over a 10-yr period, offering complete accounting results and high output at a small over-all outlay. It is said to be practical for the smallest potential user and can easily be operated by a clerk with a limited bookkeeping knowledge. Details from Remington Rand, Inc., New York 10.

GRINDING—New "G-Bond" vitrified bond developed for Norton grinding wheels is said by the maker to provide faster and better-quality work at less cost for cylindrical, centerless, surface, internal, gear, tool and cutter, form and thread grinding, and saw gumming. It can be used in conjunction with many types of abrasive including: 32 and 38 Alundum abrasive; regular Alundum abrasive; 19 and 57 Alundum abrasive. Full details from Norton Co., Worcester 6, Mass.

ELECTRONIC LIQUID-LEVEL CONTROL based on the capacitive action of liquid surrounding a porcelain-enamel-covered-electrode, the new Belmont Level Control provides adjustment of liquid level and cut-in, cut-out differential over very wide limits. Standard models operate from 115-v 60-cps supply, while special units are available for 230-v or 25-cps operation, and the control unit with indicator light can be located up to 1,000 ft from electrode. Details from Thermo Instruments Co., Belmont, Calif.

PORTABLE ELECTRIC ARC WELDER—Royal Arc unit is a 110/220 AC hand-portable welder offering a heat range of 15 to 200 amp and more, with unusual flexibility as an all-purpose, all-position welder, the maker says. It is lightweight and easily hand-carried from job to job, and, simply plugged into 110/220 AC, it's ready to weld any metal up to extra-thick steel plate. Full details from Royal Equipment Co., Burbank, Calif.

FIRE EXTINGUISHERS—A new complete line of portable carbon-dioxide fire extinguishers with a new and simplified, faster-acting valve has been announced by the American-LaFrance-Foamite Corp., Elmira, N. Y. Five Alfco models of this design are available: Model Nos. 2½, 5, 10, 15 and 20, the model numbers denoting also the weight capacity of the units. Bulletins available from maker.

STAINLESS-STEEL COATING, known as Steelast, is available in 10 colors, including black, white, gray, ivory, green, red-orange and yellow. According to the maker, Steelast is impervious to moisture, resistant to most chemicals, and is odorless and non-toxic when dry. It can be sprayed, brushed or dipped on rusted or bare unrusted metal after surface has been treated, or over painted surfaces that show positive after pretest with primer. Details from Steelcote Mfg. Co., St. Louis, Mo.

EQUIPMENT BULLETINS

A MOTOR AND GENERATOR REFERENCE BOOKLET to assist in the selection of motive power to handle most industrial applications is being made available by Allis-Chalmers Mfg. Co. The 50-p booklet is reprinted from the 1952 edition of Lincoln's Industrial-Commercial Electrical Reference published by the Electrical Modernization Bureau, Inc. Text and illustrations on integral-horsepower motors and generators for the book were furnished by Allis-Chalmers in cooperation with the Electrical Modernization Bureau. Copies of "Allis-Chalmers Motor and Generator Reference Book," Booklet 51R7933, are available on request from Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CHAIN CONVEYOR—Design and adaptation of the Long GS (General Service) chain conveyors to a wide range of surface applications are described and illustrated in 20-p Bulletin 4002 offered by the Long Super Mine Car Co., Oak Hill, W. Va. The 18-in heavy-duty unit, said to deliver 300 tph on the level and up to 150 tph on grades to 27 deg, offers advantages of long trouble-free service, sturdy construction and lower installation cost for many mining operations outside, the booklet states.

MINE TELEPHONE—Use of the MSA "MinePhone" for clear, two-way voice communication throughout a mining operation—dispatcher, shop, locomotive, loading point, maintenance and office—is pictured and described in new Bulletin 1601-1 issued by Mine Safety Appliances Co., Pittsburgh 8. Advantages cited by the bulletin include the keeping of main-line haulageways free of traffic tie-ups; reducing chances of accidents; preventing excessive stop-and-start strain on equipment; avoiding excessive power loads; coordinating trip traffic; maintaining bet-

(*Continued on p 174.*)

What's unusual about this machine?

6x36 WS PREformed Right Lang Lay
Monarch Whyte Strand with IWRC

This is a 6 x 36 PREformed rope, made up of 265 wires. That means 265 individual moving parts.

Because any wire rope is a complicated piece of machinery, it must be precision built.

There are 8 different sizes of wire in this rope — each drawn to exacting specifications for material and size.

Outside wires are one size. Inside wires are another. Core and filler wires are still other sizes.

All wires are cold-drawn to precise diameters so they will fit with snug uniformity into the structure of each strand.

Each wire is protected with lubricant applied during fabrication of the rope.

Macwhyte makes a thousand and one ropes to meet the needs of every type of equipment. Each is built with the exacting care that long, low-cost service demands.

Prompt recommendations from Macwhyte engineers are readily available without obligation.

MACWHYTE WIRE ROPE

THE RIGHT ROPE FOR YOUR EQUIPMENT

Ask for G-15 Handbook

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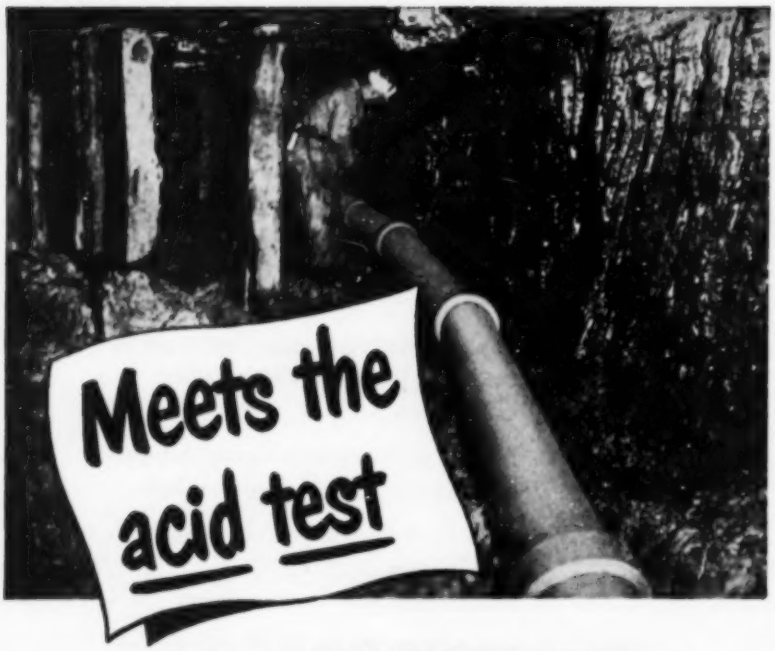
KENOSHA, WIS.

MACWHYTE COMPANY
2931 Fourteenth Avenue, Kenosha, Wis.

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York Pittsburgh • Chicago • St. Paul • Fort Worth Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

1089



...it's a TRANSITE PIPE mine drainage line!

Many installations of Transite Mine Service Pipe have passed the rugged test of carrying acid mine drainage waters for fifteen years or more.

In many cases the corrosive solutions that attacked this asbestos-cement pipe day in and day out were so aggressive that they had "knocked out" ordinary pipe in a few months!

Mine operators have found that Transite Mine Service Pipe offers advantages in addition to long service life. It is light in weight and easily installed. Lines are quickly assembled, even in restricted mine passages—can be laid around curves without special fittings. Its tight joints stay tight in service. Tough and strong, it won't deform in use.

Available for working pressures up to 150 lbs. per sq. in. and in full range of diameters from 4" up, Transite is also the money-saving pipe for water supply lines, spray and return lines from condenser cooling towers, road culverts and fire prevention ducts for carrying sulphuric fumes and condensation. For further information, write for Brochure TR-51A. Address Johns-Manville, Box 60, New York 16, N.Y.

The factory-made joints are assembled with a simple coupling puller.

Curves can be negotiated with Transite Mine Service Pipe. Deflections up to 5° can be made at each joint.

Tough, strong asbestos fibres help give this pipe many of its outstanding qualities.

Transite is a Johns-Manville registered trade-mark.

Johns-Manville
TRANSITE *mine service* PIPE

ter distribution of cars; and speeding up maintenance.

ELECTRIC CAR SPOTTERS and drum-type car pullers are discussed in detail in 24-p Book 2092 released by Link-Belt Co., Chicago 1. It describes a complete line of equipment for moving railroad cars and other heavy loads, including both vertical capstan and horizontal drum designs, and lists 18 single-drum car pullers. Engineering information includes instructions for calculating rope pulls required for moving railroad cars, considering track curvature, grades, condition of track and roadbed. Typical layouts show positioning of the machines in a variety of applications.

POWER DISTRIBUTION—A visual program which outlines the latest electric-power distribution practices for industrial plants has been announced by the General Electric Co., Schenectady 5, N. Y. The latest in the G-E "More Power to America" series, it consists of a 35-mm sound-color slidefilm and 28-p power-distribution manual and allied literature. The 20-min film, available for showings and called "The Vital Link," offers information on how to select economical unit-substation sizes, what circuit arrangements fit specific needs, how to select and maintain proper voltages, and what protective devices should be built into a power system, etc. Full details from G.E.

HOW STEMMING TIME can be cut to seconds through the use of Quick-Seal tamping plugs is described in a new bulletin published by National Mine Service Co., Beckley, W. Va. According to the brochure, Quick-Seal plugs will save powder, provide more effective breakage and greatly reduce stemming time in open-pit and underground operations.

CENTRIFUGAL PUMPS—Allis-Chalmers Type S single-statge double-suction centrifugal pumps, made in 66 standard sizes individually engineered to customer specifications, are described in a newly revised Bulletin 08B6146B released by the Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. In addition to data on construction features, the bulletin explains how to figure pumping head, carries tables of available sizes, approximate dimensions, head capacities and friction losses.

CONTROL RELAY—Application and design information on the recently introduced Type N control relay is available in Booklet B-5817 from the Westinghouse Electric Corp., Pittsburgh 30. Designed for remote-control operation, this new relay is used to sequence multimotor machines, to operate solenoids, and to obtain pilot control from pushbutton stations of electrical circuits associated with such functions as temperature and pressure regulation. The Type N relay has a 10-amp open rating, up to 600 v and six poles.

"DESK CALCULATOR" available from Pangborn Corp., Hagerstown, Md., presents in an easy-to-use pocket-sized folder of formulas, constants and conversion factors useful in basic engineering, blast-cleaning and dust-control calcula-

STOP RUST! with RUST-OLEUM®

BEAUTIFY AS YOU PROTECT YOUR RUSTABLE METAL SURFACES

Save costly tipples, machinery, draglines, coal cars, pipes, etc., in underground or strip mine operations. *STOP RUST* with RUST-OLEUM . . . and beautify as you resist moisture, fumes, weathering and many chemicals. Apply *directly over sound rusted surfaces* after scraping and wirebrushing to remove rust scale and loose particles. Get the facts, now! Prompt delivery from Industrial Distributors in principal cities of the United States and Canada.

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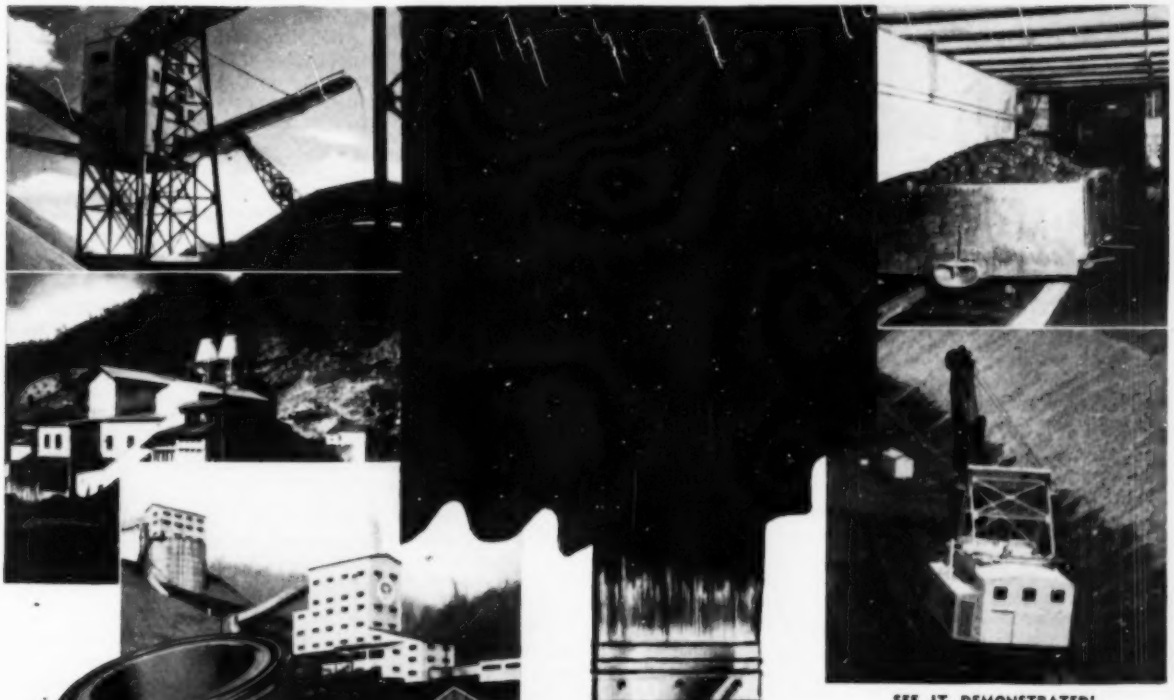

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- ☐ Have a Qualified Representative Call
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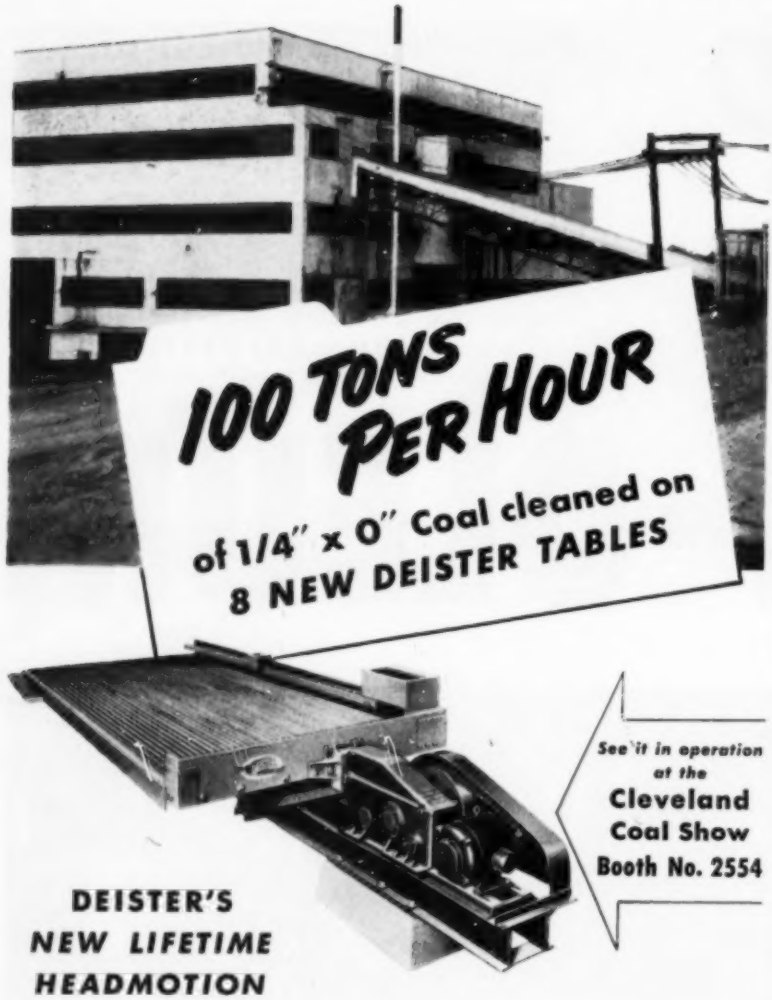


DEISTER'S NEW LIFETIME HEADMOTION

Anti Friction Bearing Headmotion—For longer life, reduced maintenance, less downtime; anti friction bearings reduce starting hp required.

Wider Stroke Variation—Offers greater number and variety of combinations of length of stroke in relation to speed of stroke for much greater efficiency.

Easier to Service—Upper housing is cast aluminum alloy, weighs one-fourth of previous unit housings; unit easier to service and adjust.

Lower, More Streamlined—New headmotion is lower and wider, mounting channels further apart for greater stability.

Eight new Deister Coal Washing Tables, with the new Deister Lifetime Headmotion, are setting new records for the profitable recovery of fines in the new modern streamlined tipple of Miners Coal Company's Fies Mine at Madisonville, Kentucky.

Pleased by new peak performance, Kenneth Snarr, General Manager says: "We feel there would be no other way of recovering the valuable fines so satisfactorily. We bought the eight new-type tables because of the excellent performance of Deister Tables installed in 1947 at our Williams Mine."

Get new efficiency—cleaner fines with minimum ash and sulphur. Investigate the *new Deister tables* with the *New Deister Lifetime Headmotion.* Call, write or wire today!

DEISTER SCREENS

DEISTER MACHINE COMPANY
FORT WAYNE 4, INDIANA

tions. Included are geometric relationships for circles, squares, cylinders, spheres, pyramids, cones, trapezoids, etc.; measures of pressure; calculation guides for determining tank capacities in gallons; formulas for dust-control work, etc.

PLASTIC PIPE – Folder from the Anesite Co., Chicago 45, describing the company's plastic pipe, known as Black Buty, includes specifications on pipe from ½- to 6-in diameter; estimated working pressures; data on chemical resistance; fittings available, etc.

MOTOR STARTERS—Tips on selecting the right starter for squirrel-cage induction motors rated up to 600 hp at 600 v or less are contained in new Bulletin 14B7733 available from the Allis-Chalmers Mfg. Co., Milwaukee 1. The bulletin tells how to select the proper-type starter, enclosure and operating arrangement, and explains how to determine whether a full- or reduced-voltage starter should be used.

WIRE-ROPE SPOOLING – 86-p "Wire-Line Spooling Handbook" contains considerable detailed information on the correct use and installation of wire rope and the Lebus-grooving and controlled-pyramid spooling system. While primarily prepared for the oil-drilling industry, the booklet provides much data of value to those handling and operating wire rope. Offered by Lebus International Engineers, Ltd., Wichita Falls, Tex.

CLEANER for electric motors and generators designed for safe, effective application without disassembling the units is described in Folder F-112 available from the Shaler Co., Waupun, Wis. Instructions for its use, prices and other information are included.

MACHINERY SALVAGE – How a leading manufacturer of heavy road-building equipment uses metalizing for the salvage of axles accidentally mis-machined in its production shop, with considerable cost savings and a service life found to be longer than with an unmetalized part, is described and illustrated in the current issue of *Metco News.* Other metalizing applications, including salvage of worn spindles, cast-iron rolls and truck anchor pins, also are described in Vol. 6 No. 7, offered by Metallizing Engineering Co., Inc., Long Island City 1, N. Y.

ELECTRIC MOTORS—Bulletin RS-2 available from the Lima Electric Motor Co., Lima, Ohio, presents the complete line of Lima dripproof induction motors featuring prelubricated sealed ball bearings throughout. The brochure includes speed-torque curves, frame number charts, mountings, dimensions and specifications for Lima motors from ⅓ to 150 hp.

METALLIC RECTIFIERS – Bulletin GEA-5658B on G-E metallic-rectifier power-conversion units, available from General Electric Co., Schenectady 5, N. Y., lists the design features, advantages, description, performance, circuits, dimensions and ratings for the complete line, rated from 125 to 250 v DC. A

MINING'S CHOICE *for* PORTABLE POWER TRANSMISSION

Modern mining technique permits no pampering of men or equipment. From power source to working face, everything must keep pace with production schedules. That's why it's important to *you* that more JOY connectors are used in mining operations than all other brands combined.

This proves that JOY plugs, receptacles and distribution boxes "measure up" to the industry's high standards for performance, safety and durability.

JOY plugs are molded to cable as one-piece Neoprene units—shatter-proof, wear-resistant, and impervious to the deteriorating effects of moisture, grime or oil. Through them, power cable can be sectionalized into easily handled lengths for rapid replacement of damaged sections.

JOY plugs are supplied for A.C. or D.C. operation in current capacities as required. They are available in three or four-contact models, described below, and also with one or two conductors. ● Write for complete details and bulletin today!

Straight Pin Bigun (SPB) plugs illustrated at top and left are JOY's three-conductor style with pilot contact. Note reversed contact for polarization and grounding.

NO. D3A371RF Female

3-CONDUCTOR DESIGNS (*for D. C. Application*)

REVERSED PIN PLACEMENT: Male plug has one socket that engages contact pin in female plug for grounding and polarization. Supplied for #10 through 750 MCM wire sizes.

PILOT PIN DESIGN: As above except for two additional "pilot control" contacts that may be shunted or carried through cable on #10 wire. Supplied for #8 thru 500 MCM wire sizes.

4-CONDUCTOR DESIGNS (*for A. C. Application*)

REVERSED PIN PLACEMENT: Male plug has one socket that engages contact pin in female plug for grounding and polarization. Supplied for #10 through 500 MCM wire sizes.

PILOT PIN DESIGN: As above except for two additional "pilot control" contacts that may be shunted or carried through cable on #10 wire. Supplied for #10 through 400 MCM wire sizes.

IMPORTANT: Pilot pin designs are *permissible* when used with JOY Safety Circuit Center power distribution boxes. *Write for complete details.*

Consult a Joy Engineer

WBD ME 4131

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

Insure Safety with SIMPLEX ROOF JACKS and PULLERS in Roof Bolt Installation

For Temporary Support During Installation . . .

Simplex Mine Roof Jacks—Safe, inexpensive, temporary roof support is provided by Simplex Roof Jacks during installation of suspension supports. They eliminate need for costly, time-consuming temporary timbering. Available in 8 and 16 ton capacities with several types of heads and a wide range of heights.

For Testing Load Factor After Roof Bolt Installation . . .

Simplex Re-Mo-Trol Hydraulic Center-Hole Pullers—Check the strength of roof bolt installations with the new Simplex Re-Mo-Trol Hydraulic Pumps and Rams. Re-Mo-Trol with a Center-Hole Ram is the easiest, safest method for testing the load-bearing ability of suspension supports. Tests are made merely by slipping the Re-Mo-Trol Ram over the bolt, which passes through the Center-Hole, and fastening the nut. Smooth, torque-free force is applied by operating the pump unit, and the stress can be read directly in tons from a gauge on the pump. The test is completed in minutes! Re-Mo-Trols are available in 7 models—10 to 100 ton capacities.

THE CENTER-HOLE MAKES IT EASY . . . only Simplex has the Center-Hole

Where a self-contained testing unit is desired, the Simplex Center-Hole Jenny is ideal. Six models in capacities from 30 to 100 tons.

For full information, write for Bulletins: HYDRAULIC 51R and MINES 47

SIMPLEX JACKS—*Standard for Safety —for ALL Mining Jobs*

Simplex LEVER • SCREW • HYDRAULIC Jacks

TEMPLETON, KENLY & CO.

1040 South Central Avenue, Chicago 44, Illinois

guide is also provided as an aid in preparing contact specifications which entail G-E DC power supplies and exciters.

V-BELTS—A new fractional-horsepower V-belt catalog for use in servicing light-duty applications is offered by Raybestos-Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J. Belts are listed according to the new industry-standard numbering system and various types of machines are listed together, alphabetically by company or trade names, for convenience in determining the proper belt.

ELECTRIC INSULATION—"Quinterra-Quinorgo," a new 32-p publication issued by Johns-Manville, New York 16, gives complete information about these electrical insulations made of purified asbestos . . . why they were developed, what their characteristics are, where they may be used to advantage. Included are tables of test data on physical and electrical properties, details of application techniques and case histories illustrating improvements in finished products, such as space savings, lower weight, economy of materials and longer service life.

SAND PUMPS—Why pressure-molded rubber parts in its SRL rubber-lined sand pumps maintain high efficiency for prolonged periods is described and illustrated in 20-p Bulletin P9-B8 published by Denver Equipment Co., Denver 17. Case histories show that rubber parts last from 6 to 50 times longer than the best hard-iron or steel parts and the simplicity of construction of Denver SRL sand pumps means that they are easier to operate and maintain, the maker says. The company also offers Bulletin P10-B4 which describes how the Denver vertical centrifugal sand pump handles frothy pulps without dilution or continuous operating attention, along with details of construction and sizes.

SPHERICAL ROLLER BEARINGS of the self-aligning type made by the Bantam Bearings Div. of The Torrington Co., S. Bend 21, Ind., is covered in Bulletin 200-C offered by the company. The bulletin describes the complete line and includes such engineering data as life expectancy, capacity ratings, installation and service factors, speed data, loads, fits, lubrication, etc.

ELECTRIC HEATERS—Bulletin E-1 describing the Wing line of electric unit heaters and heater sections for general, industrial and commercial heating as well as for specialized use in heating corners of factories, warehouses, etc., is available from the L. J. Wing Mfg. Co., Linden, N. J. Engineering data includes capacity tables, dimensional data and mounting heights and coverage.

ADDING MACHINES—Booklet C409 from Remington Rand, Inc., New York 10, describes various hand-operated adding machines featuring the simplified 10-key keyboard that permits fast and easy touch method of operation. Multiplication, automatic column selection and indicator, and direct subtraction are among the features of the portable units.

For over or under base installation, the AW-22 is used for spanning joints and for cross-bonding.

One of four bonds applied by steel arc-welding is the AW-20. Other O-B joint plate bonds are mechanically applied or welded with copper alloy

An excellent mechanical bond for permanent or reclaimable use is the O-B Wedge Bond.

AW-19 Rail Bonds are installed under the rail base by steel arc-welding. AW-18 Rail Bonds are copper arc-welded.

Steel arc-welding applies AW-8 Rail Bonds to the rail head. Terminal is designed to minimize possibility of damage from car wheels.

O-B Bonds meet Every Mine Need!

joint plate bonds - cross bonds rail head - over or under base

Two of the bonds shown here — the AW-22 and the Wedge Bond—work out well in several uses, as cross bonds, joint plate bonds, or for over-base or under-base installation. The others serve more specific uses. All five are much-used by repeat customers who know what they need to get track bonded right!

But preferences and requirements change from one mine to the next, and to make sure that you can get the bond that you want for your haulage system, O-B makes more than 16 different types. Some are applied by arc-welding, with either steel or copper. Others are applied by mechanical means.

Look for them in your No. 27 Mining Catalog. Or ask an O-B representative to help select the two or three types that will do the best job for you!

Ohio Brass

MANSFIELD OHIO, U. S. A.

4342-M

See the U. S. Rubber belt technician demonstrate "Belt Surgery" at the coal show

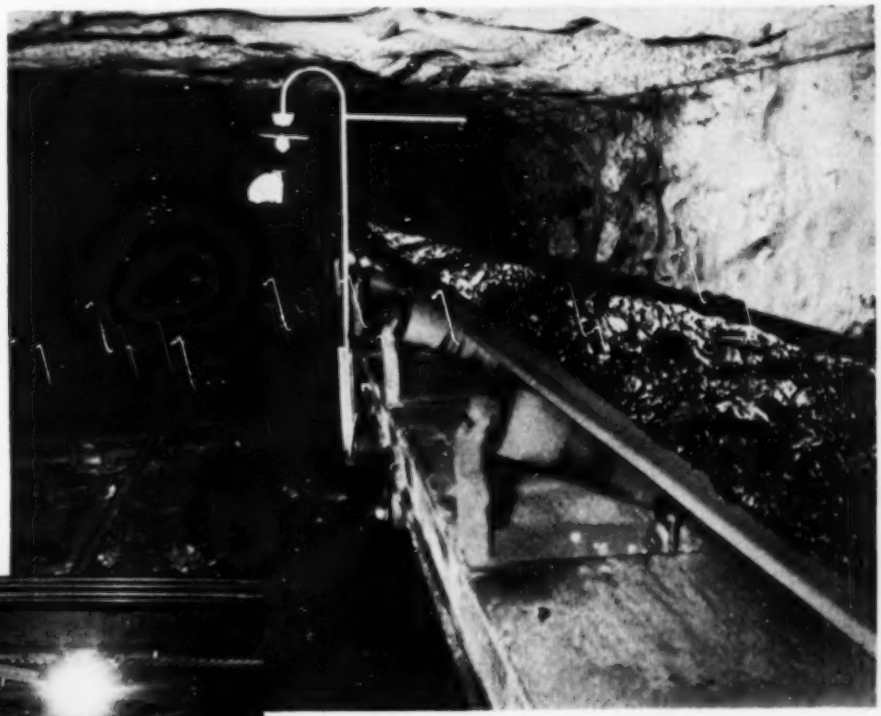
Again this year, you have the unusual opportunity of watching a belt technician at work at the coal show. His remarkable skill has caused him to be likened to a surgeon. One of United States Rubber Company's technicians will demonstrate his matchless skill at splicing belts. He has made splices on "U.S." conveyor belt installations throughout the country. When you see how he splices and vulcanizes a belt, you'll get an idea of what U. S. Rubber means by installation perfection and belt maintenance. And be sure to pick up your free copy of "A Practical Way to Repair Conveyor Belts."

See you at the show, Booth 1215.

The U. S. Rubber Booth will also display hose, tape, rubber-lined pipes and fittings, V-Belts, packings, pinch valves, Uscolite® pipe and fittings, Royal-guard protective coatings and U.S. trolley guard rubber for the coal industry.

UNITED STATES RUBBER COMPANY

Brand-new mine specifies U. S. Belting



U. S. Rubber Ustex-nylon slope belt carrying mechanically loaded Pittsburgh seam bituminous coal. It is 2900 feet long.

U. S. Rubber surface belt, 1000 feet long, receives coal from the slope belt, carrying it to bins. The belt system handles approximately 600 tons per hour.

A new mine in West Virginia makes full use of mechanized coal haulage. And when it came to selecting the conveyor belting, the mine officials specified U.S. Rubber's Ustex®-Nylon Belt. Two great textiles are combined in this belt: "U.S." patented Ustex for strength, Nylon for flexibility and unusual troughability. The great strength of this belt means that it can handle longer centers, higher lifts than any duck-and-rubber belt and weighs half as much for equal unit strength.

Get the most out of your haulage system by selecting U.S. Belting. There's no better way to keep haulage costs at a minimum. Call on any of the 25 "U.S." District Sales offices, each staffed with engineers—or write to address below.

"U.S." Research perfects it..."U.S." Production builds it...U.S. Industry depends on it.

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SERVING THROUGH SCIENCE

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Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Molded and Extruded Rubber and Plastic Products Protective Linings and Coatings • Grinding Wheels • Packings • Tapes • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

M·S·A BOOTH NO. 1009

at the Coal Show

M·S·A BOLT-HOLE CLEANER

Here's the practical answer to dust created by rotary or percussion drilling. An ideal aid to roof-bolting. U. S. Bureau of Mines Approved. Come in for the facts!

M·S·A–WOLF JUNIOR FLAME SAFETY LAMP

Dependable, steady flame, guarded from drafts by improved ventilation and specially designed openings. Easy-to-read standard size graduated chimney. Its light weight and small size make the inspection job easier. 70% of parts interchangeable with standard size model.

EDISON R-4 ELECTRIC CAP LAMP

The dependable and better light of the Edison R-4 Lamp is transferring the production advantages of today's modern equipment into steadily climbing production figures. Let us show you how its brilliant, unfailing beam gives miners the light they need to work mechanized equipment at its greater capacity, safely.

M·S·A METHANE RECORDER

Provides a continuous record of the concentrations of methane in return air at all times. Immediately indicates unusual gas conditions due to interruptions in ventilating currents, and serves as a valuable guide for regulating the volume of air required to maintain proper and economical ventilation standards.

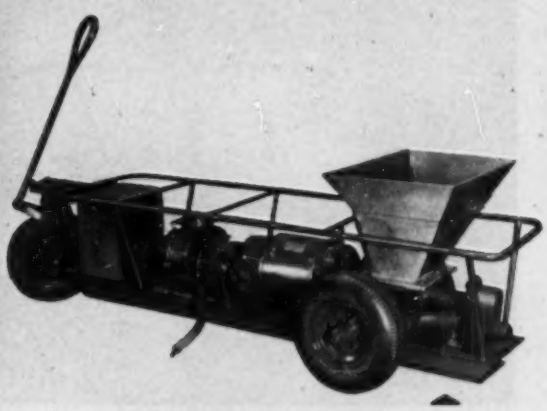
full of New
PRODUCTION-SAFETY IDEAS!

It's "Curtain Time" at the Coal Show, and M.S.A. will again show many products to help you better your production, boost overall mine safety. The products featured here are only a few of the many you'll find of interest. You'll want to see, and learn, first hand, how these items can fit into your mining plans. You are cordially invited to stop in and visit. We'll be glad to discuss how these can be of benefit to you.

M·S·A MINEPHONE

Sends dispatcher's orders instantly and simultaneously to all motormen who can also reply or communicate with each other *while trips are in motion*. Coordinates haulage movements with production demands. Keeps trips on the move—less wear and tear on equipment; saves time; aids safety.

M.S.A. HoistPhone also available for continuous voice communication between hoisting engineer and cage, at any level, and when cage is in motion.



M·S·A BANTAM ROCK DUST DISTRIBUTOR

Fast, economical distribution of rock dust right up to the working face. Readily transported on shuttle cars, on conveyor belt or rubber tires. Other electric or compressed air models available to meet your every need.

M·S·A DUSTFOE #55 RESPIRATOR

The modern respirator that's tops in worker acceptance! Users like its lightweight comfort; its streamlined design that avoids "blind-spots"; its easy breathing quality. Effective filtering action gives maximum breathing protection. U. S. Bureau of Mines Approved. Come in and examine the features.

M·S·A SELF-RESCUER

For immediate breathing protection in emergencies caused by fire or explosion. Provides precious minutes of emergency breathing protection so vital to the miner while traveling through carbon monoxide to fresh air. Can be carried by the miner or stored in convenient steel caches anywhere in the mine.

MINE SAFETY APPLIANCES COMPANY

Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

At Your Service: 77 Branch Offices in the United States and Mexico

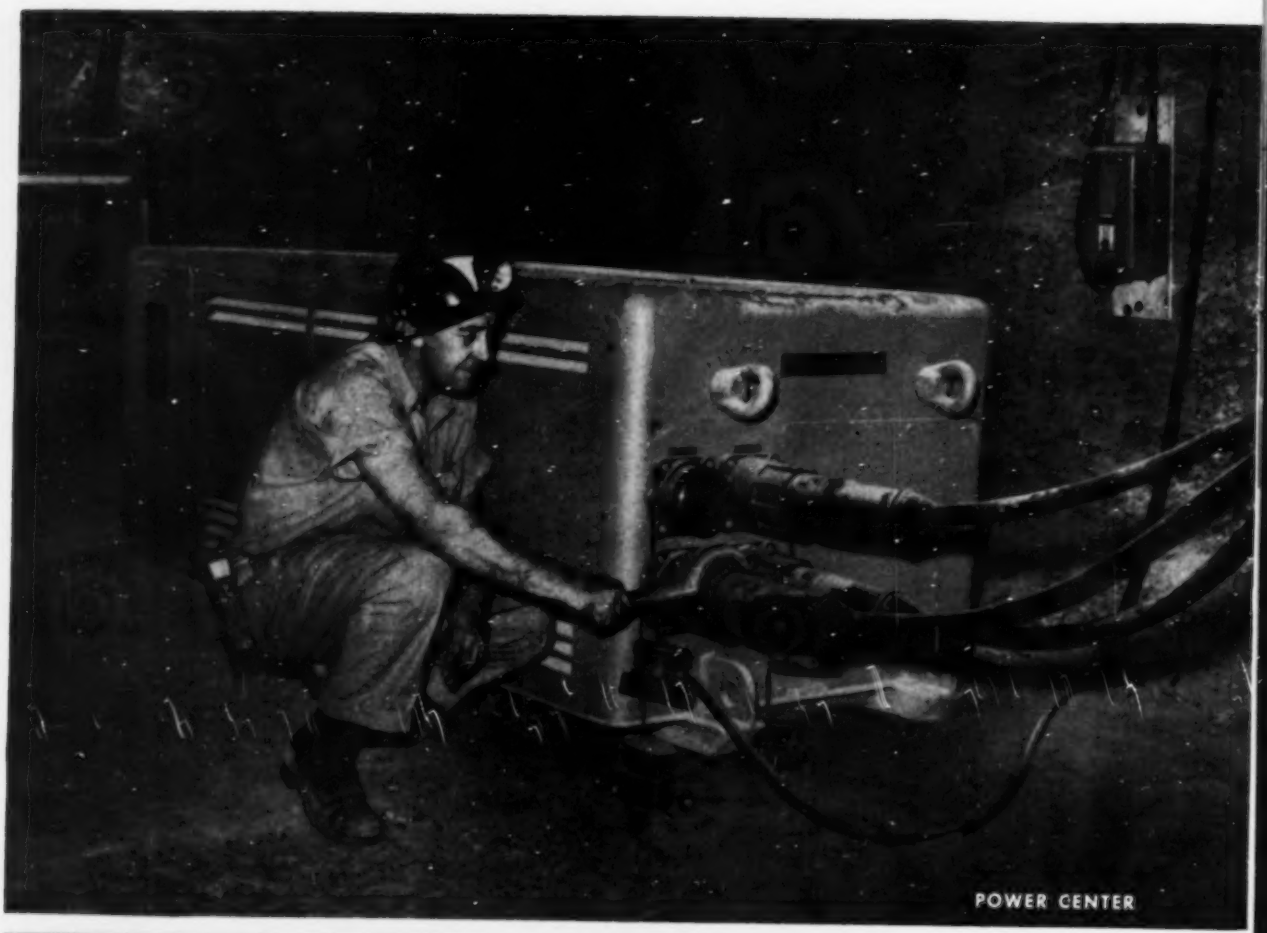
MINE SAFETY APPLIANCES CO. OF CANADA, LIMITED

Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, New Glasgow, N.S.

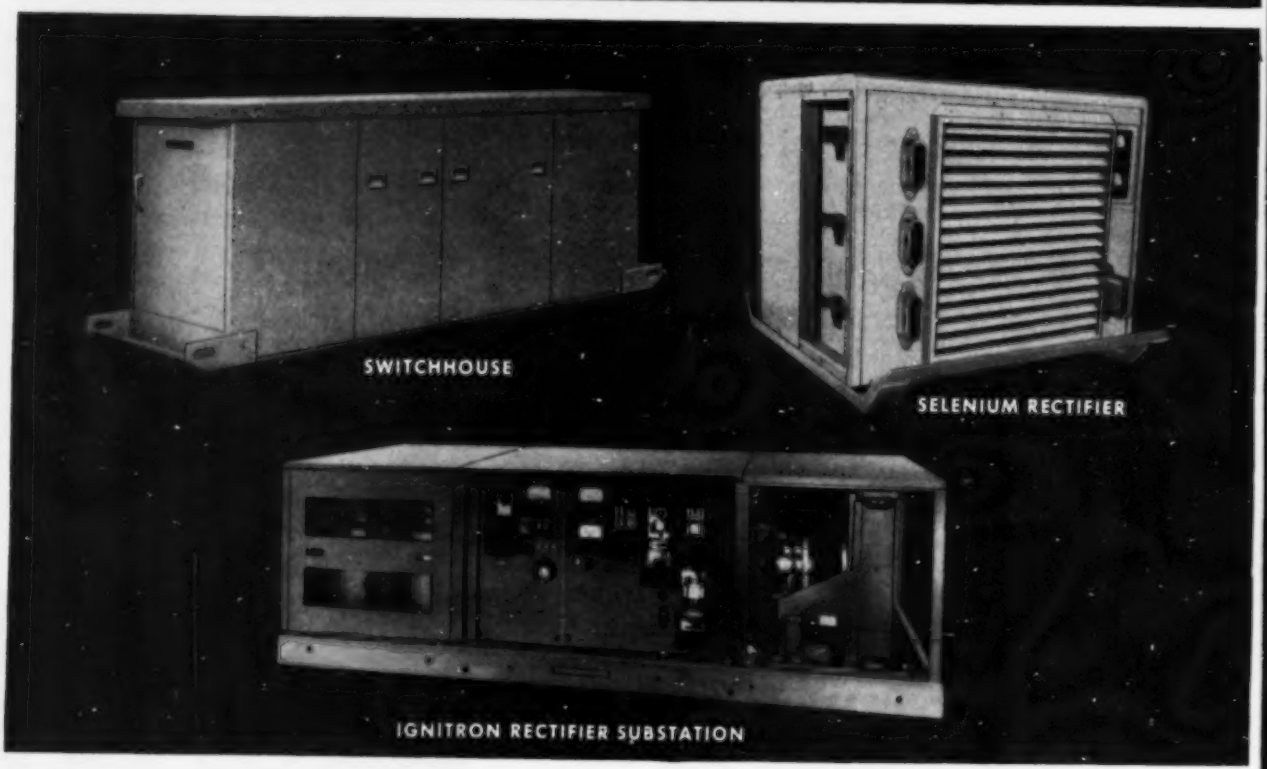
MSA

SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M.S.A. is at your service . . . our job is to help you.



POWER CENTER



SWITCHHOUSE

SELENIUM RECTIFIER

IGNITRON RECTIFIER SUBSTATION

Skid 'em in...hook 'em up!

...Westinghouse "plug-in" power packages come ready for work

No further engineering needed! No planning of related equipment necessary! Whether you use a-c, d-c or a combination of both in your mine, Westinghouse underground "power packages" are available for your needs. These complete integrated units can save you days or even weeks of installation time. They are shipped to you ready to use. Compactness and portability make it easy to move them close to the load, minimizing power losses and voltage fluctuations which result from long cable runs. Plug-type receptacles make hookup fast and easy.

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Westinghouse switchhouses control high-voltage a-c circuits to high-voltage motors or power centers. Each switchhouse is equipped with a circuit breaker which automatically disconnects the circuit in case of overloads, short circuits or ground faults. Thus, trouble is isolated without impairing service to other sections of the mine.

Power Centers step down a-c power for smaller machines—Underground power centers provide low voltage close to the load. They include dry-type, air-cooled transformers which eliminate the problems connected with liquid cooling. Circuit breakers protect each outgoing low-voltage feeder. Plug-type connectors are provided for all incoming high-voltage and outgoing low-voltage circuits.

Ignitron Rectifiers supply large amounts of d-c power

For large blocks of d-c power, above 150 kw, Ignitron rectifier substations provide the most reliable and economical method of power conversion. They are delivered complete with nothing else to engineer or buy. Simply connect up the incoming a-c line and outgoing d-c cables and you are in business. Over 450 such Westinghouse units are rendering outstanding service.

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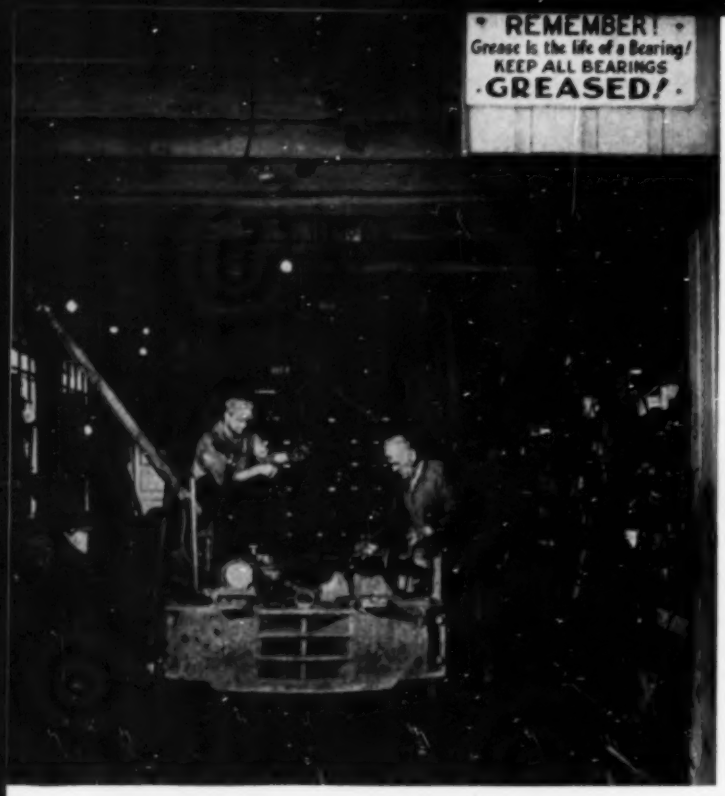

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SHORT WALL CUTTERS, blowers, locomotives, mine car wheels, tipple drive gears and shaker are among the varied pieces of Sun-lubricated equipment.

100% SUN LUBRICATION HELPS KEEP MAINTENANCE COSTS DOWN

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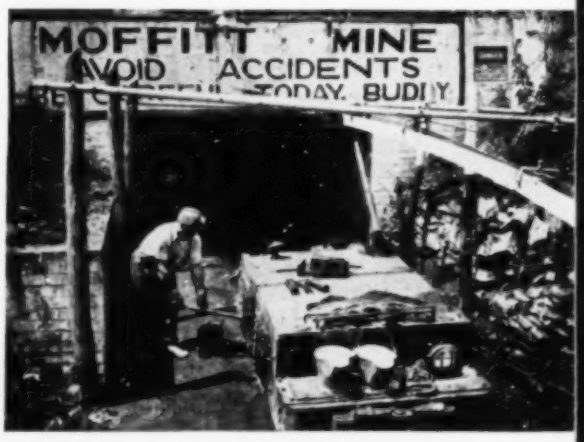
You too can benefit from Sun Lubricants, with the trouble-free service they provide. For complete information, consult your nearest Sun representative. Or send your inquiry to SUN OIL COMPANY, Philadelphia 3, Pa., Dept. CA-5.



PROPER LUBRICATION of the mine car wheels and locomotive has paid big dividends in reducing maintenance and increasing the loads hauled.

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News Round-Up

Coal Backs Simpson Bill As Oil Men Fight Imports

COAL INTERESTS have asked governors of 28 coal-producing states to carry the battle against imported residual oil into the Governors' Conference called by President Eisenhower for May 4-5 at Washington, when the state chiefs will be briefed on world conditions by Cabinet members and other top government officials. Purpose of the request is to obtain a statement of coal's viewpoint at the highest government levels in the hope that the President will approve quota limitations on foreign oil. The President has urged extension of the Reciprocal Trade Agreements Act, under which oil, oil products and other goods enter the United States from abroad, but he has not committed himself on proposed changes that would limit imports that reach a "peril point."

The move to bring the issue before the governors' gathering capped a series of steps to dramatize the threat of foreign residual oil and win support in Congress and elsewhere for the Simpson bill (H.R. 4294). Hearings on the bill, which was introduced in the House March 30 by Rep. Richard M. Simpson (R., Pa.), were scheduled to open April 27 before the House Ways & Means Committee. Coal's case will come up about May 12.

The Simpson measure, which would extend the Reciprocal Trade Agreements Act to June 12, 1954, provides a limit on residual imports in any quarter to 5% of domestic demand for residual in the corresponding quarter of the preceding year. The bill also provides a similar 10% limit on imported crude petroleum and petroleum products. Other changes proposed by the Simpson measure are: (1) establishment of a mandatory peril-point provision, (2) addition of one member to the present 6-man Tariff Commission, (3) a speed-up in Tariff Commission procedures, (4) broadening the definition of "damage" as applied to the effect of imports on domestic industries and (5) provision of protective measures for lead, zinc and agricultural commodities.

Support for the Simpson bill was voiced March 31 by Tom Pickett, executive vice president, National Coal Association, and on April 1 by R. E. Snoberger, chairman, NCA Special Committee on Natural Resources. Mr. Pickett said that the measure "merits the full support of all elements adversely affected by the flood of foreign oil importations." Dr. Snoberger urged all interested parties to give full support to the bill. On April 8, the Executive Board, Foreign Oil Policy Committee, endorsed the bill and laid plans for presenting arguments before the Ways & Means Committee.

Meanwhile, authors of other bills aimed at cutting residual imports announced their support for the Simpson bill, pointing out that incorporation of the 5% limit on residual into the proposed changes in the Reciprocal Trade Agreement Act would assure the coal industry of an early hearing. Statements in support of the bill were made by Congressmen R. C. Byrd (D., W. Va.), J. E. Van Zandt (R., Pa.) and A. B. Kelley (R., Pa.). Congressman Kelley contended that the flood of residual imports is "weakening our defense efforts as effectively as if it were a Kremlin-directed maneuver."

Introducing his bill to Congress, Rep. Simpson contended that the need for such legislation has "long been obvious" to protect coal and other industries and to strengthen the Nation's security. Since 1946, he said, residual imports have totaled 600,000,000 bbl, the equivalent of 150,000,000 tons of coal, with losses of $335,000,000 in miners' wages, not to mention losses to railroads and railroad workers. He declared that excessive imports also have stunted development of the domestic oil industry.

Earlier, toward the end of March, strong sentiment against unlimited oil imports was expressed in domestic oil circles. On March 25, in a report to C. H. Lyons, president, Independent Petroleum Association of America, Russell B. Brown, general counsel for the group, pointing to the perils of relying on imported oil, urged members of the association to plead their case before Congress. With oil essential to national security, he said the Nation has two alternatives: "We can encourage the thousands in our own industry to continue to find and make available this essential oil, or we can encourage a few large international oil companies, now prosperous, to bring more oil from countries already enjoying the market to 9% of the world's population." The latter course, he argued, will retard our own national development. Importing companies have failed to observe the agreed-upon policy that oil imports should supplement, not supplant, domestic supplies, he charged.

Elsewhere, R. G. Dunlop, president,

(*Continued on p 188.*)

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Coal Basic for Nation, Utility Official Says

"The supply of all other sources of energy, other than coal, is insufficient to supply more than a part of the needs of our economy," says Robert E. Dennis, fuel agent for the Consolidated Edison Co., New York, in a letter released last month to Appalachian Coals, Inc., for publication. The communication was addressed to William J. Tracy, president of M. & J. Tracy, Inc., a leading concern in coastwise vessel transportation of bituminous coal along the Atlantic Seaboard.

To answer the question "What do you see ahead for coal?" Mr. Dennis went on to say: "The supply of coal within our boundaries exceeds all known sources of oil by many times. Coal is our most abundant energy source; therefore, coal must be considered our basic fuel.

"Moreover, the supply is near at hand, and its delivery relatively free from interruption in case of armed conflict. The demand for all petroleum products from our armed forces rises rapidly at such times, because of their value for mobile power plants. So let us recognize that coal is our basic, most dependable source of energy for static power plants. And let us see to it that the coal industry is not so injured by loss of business to liquid and gas fuels as to make it impossible for it to absorb a large and rapid demand to supply the energy needs of our basic industries, which employ static power plants."

Calling on consumers generally to stay with coal in this difficult competitive period for their own long-range interest, Mr. Dennis continues: "After that, it is my opinion coal can be able to meet all competition, due to the demand for coal from the utility and chemical industries. To keep the coal industry healthy and competitive, it needs, above all else,

(*Continued on p 188.*)

FUEL OIL . . . Cont'd

Sun Oil Co., speaking to the American Association of Petroleum Geologists at Houston, Tex., appealed to oil-importing companies to cut their imports voluntarily. To wage a global war, our Nation must be fully self-sufficient in oil, he said. Later, on March 31, addressing the Texas Independent Producers and Royalty Owners' Association at San Antonio, Tex., Roy J. Turner, former governor of Oklahoma, said that imported oil now is costing domestic producers more than $330,000,000 in lost production. "State after state has been forced to reduce producing allowables because of excess supply," he stated.

Later, on April 14, responding mostly to seasonal market changes, two big importing companies advised the Texas Railroad Commission that they expect to reduce their imports over the coming months. Standard Oil Co. (N. J.) announced a reduction of 18,000 bbl per day of petroleum imports; Socony-Vacuum Oil Co., a cut of 5,000 bbl per day. To coal men and domestic oil producers, however, the cut appeared negligible against imports of residual alone that averaged 447,100 bbl per day in the 4 wk ended March 21.

COAL BASIC . . . Cont'd

tonnage sufficient to meet its inherent mining load factor. By that I mean that the nature of coal mining is inherently such as to preclude part-time operation. Sufficient tonnage, in fairly even distribution throughout the year, is all coal needs to be set for any demand which can be placed upon it."

Emphasizing the inevitable growing dependence of the American economy on bituminous coal, Mr. Dennis says: "As the needs for more power come upon us in the future, it's a cinch that coal will have to supply the bulk of it."

Turning to the economy side of fuel-price economics, Mr. Dennis notes that coal "cannot make its price competitive unless it can secure tonnage sufficient to obtain maximum economy," and makes these pertinent suggestions as to what can be done about it:

"In the first and most important place, there is need for recognition on the part of all industry that, in harming coal, they are jeopardizing the future security of this country and, of course, themselves. Of what use are millions upon millions of tons of coal near at hand, with no one willing to put up the money, no one willing to put in the labor to obtain it? I am the buyer for a company whose needs for fuel are enormous, and whose struggles for more economical ways to give better service are unceasing. Nevertheless, we see clearly that today's economy may be tomorrow's disaster and, we must, therefore, have strong, efficient industries to supply and transport our fuels and, in so far as we can do so, help them to stay that way."

Mr. Dennis emphasizes the sincerity of this statement by saying: "So, in spite of market conditions, we will fuel our system this year 66% with coal, 18% with oil, 9% with gas, and the balance will be allocated throughout the year as operating conditions require."

Recommending to the M. & J. Tracy Company that they make the contemplated investment in new coal-carrying equipment, Mr. Dennis says:

"Only by so doing have you been able to avoid any increase in the cost of coal transportation. Yours has been a welcome contribution. I wish the railroads would do as well, because the cost of transportation is too great a burden on coal. But coal has a future, and I wish the coal industry would lift up its eyes and its chin. I wish the coal industry would regain control of its own business, without which I cannot see how it can prosper, no matter how much we help."

News Briefs and Trends

Power Pinch Looms

Secretary of the Interior McKay told the Senate Banking Committee April 1 that it may be necessary to allocate electric power "in certain regions of the country" during the next 2 yr to keep defense production going. He urged continuation until June 30, 1954, of full power to grant priorities and allocate materials. Such authority, he said, would be used to assure completion of power projects related to Atomic Energy Commission activities and other defense activities.

Moody Asks Taft-Hartley Curb on Welfare Funds

Joseph A. Moody, president, Southern Coal Producers' Association, has asked Congress to re-examine the whole matter of private welfare funds. Appearing April 8 in Washington before the Senate Labor Committee, Mr. Moody said that welfare payments from the UMWA Welfare & Retirement Fund to eligible miners far exceed the total dividend payments to shareholders and are far greater than the profits of the companies that pay into the fund. He said he did not believe that the terms of such funds should be negotiated "in the heat of collective-bargaining crises, nor should they be the result of the monopoly power of industry-wide or area group strikes."

Sporn Says Coal Will Be Major Fuel for Electric Power

Philip Sporn, president, American Gas & Electric Co., one of the Nation's biggest electric utility companies, told stockholders in his annual report for 1952 that "coal will continue to be the principal source of fuel for economical power for at least the next 20 to 25 yr." Power from nuclear energy is only a hope and nothing has yet been done to warrant belief that a nuclear electric-power plant can be built for commercial use in the near future, he said. However, his company is taking part in the study of atomic power, he added.

UMWA Lets Contracts For Regional Hospitals

The UMWA Welfare & Retirement Fund has signed contracts for construction of 10 hospitals in mining towns in

(Continued on p 210.)

NCA Official Accepts Award

TOM PICKETT (center) executive vice president, National Coal Association, on April 2 accepted the George Washington Honor Medal awarded by the Freedoms Foundation, Inc., to BCI's motion picture, "Powering America's Progress." The presentation was made in Washington, D. C., by Kenneth D. Wells (left), the Foundation's president. Mrs. Robert A. Vogeler Jr., whose American businessman-husband was imprisoned for 17 mo by Hungary, participated in the ceremony as a director of the Foundation.

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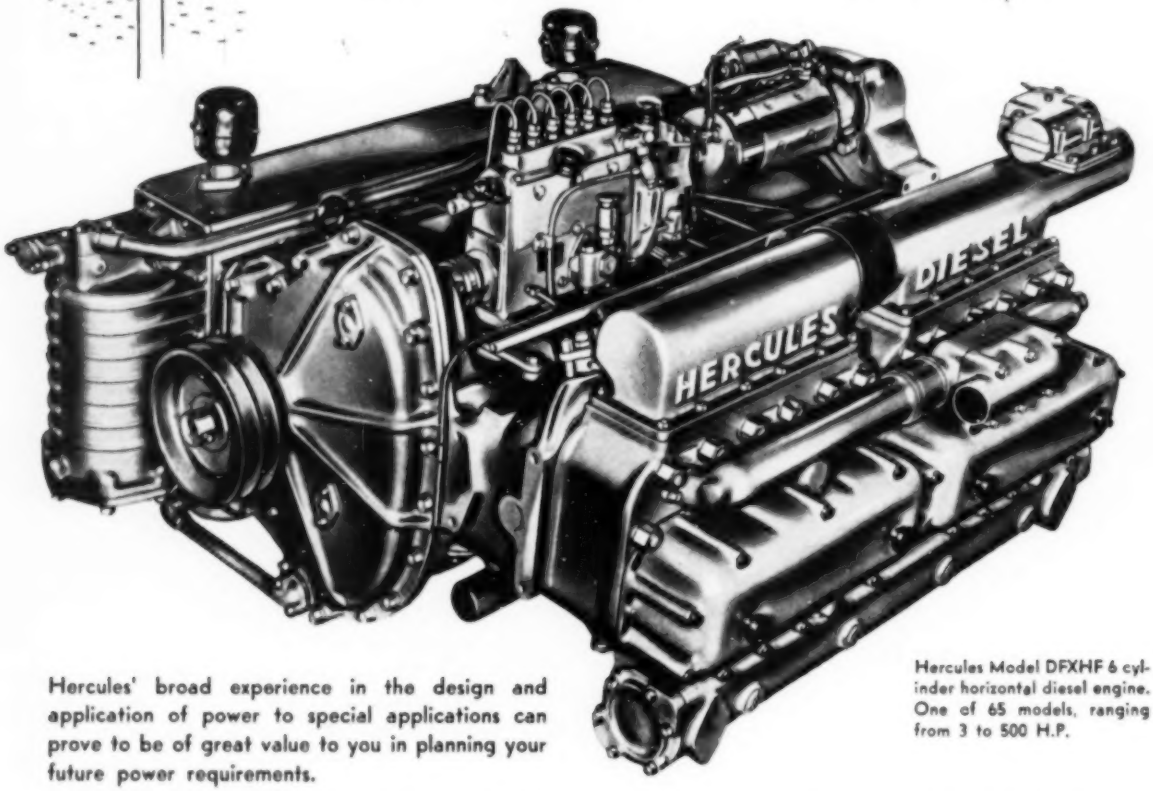

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Personal Notes

H. S. DeWitt, superintendent, Dorrance colliery, Lehigh Valley Coal Co., Wilkes-Barre, Pa., for the past 16 yr, has been named assistant to the general manager, succeeding **Charles P. Stewart,** who is retiring after 46 yr of service to the company. Mr. DeWitt joined Lehigh Valley 37 yr ago as a member of the engineering staff, and from there was promoted to assistant superintendent at Dorrance colliery. Mr. Stewart, starting as a carpenter's helper, worked on the construction gang, served as shipper and colliery clerk, and in 1920 moved to the company's main office where he held various clerical positions, advancing to assistant to the general manager 14 yr ago.

W. L. Burgess, tipple foreman, Sagamore mine, Pocahontas Fuel Co., McComas, W. Va., for the past 29 yr, was honored April 1 at a banquet given him upon his retirement. Mr. Burgess had been with the company at Sagamore for 43 yr.

John E. Urquhart, who until his retirement in 1944 was general superintendent of all company operations, has been made president, Woodward Iron Co., Woodward, Ala., succeeding Bradford C. Colcord, resigned. Prior to joining Woodward in 1933, Mr. Urquhart was vice president in charge of operations for Semet-Solvay.

W. H. Hayes has been named superintendent, Dana mine, Amherst Coal Co., Rensford, W. Va., succeeding **T. E. Mitchem.**

T. P. Latta, superintendent, Crucible Steel Co. coal mine, Crucible, Greene County, Pa., has retired after more than 20 yr of service. **Charles B. Tillson Jr.,** assistant superintendent, succeeds Mr. Latta.

Col. Henry Crown, chairman of the board, Freeman Coal Mining Corp., Chicago, received the Horatio Alger award April 8. Col. Crown, a prominent industrialist, is chairman of the board, Material Service Corp., Chicago; Marblehead Line Co., Chicago, and the Empire State Building Corp. in New York.

William Maratta, assistant to the vice president, Lillybrook Coal Co., Lillybrook, W. Va., has resigned to join the Pocahontas Fuel Co., Inc., Pocahontas, Va.

Jim Ed Workman has been appointed assistant personnel manager, Lorado Coal Mining Co., Lorado, W. Va. Entering Marshall College in 1946 after working summers at Lorado, he returned to the company in a year, working as trackman, buggy driver, dispatcher and at other jobs. In 1949, he was advanced to unit foreman and then, in 1950, returned to Marshall College to earn a BS degree. Mr. Workman taught at Man High School prior to his recent appointment.

The New River Co., Mt. Hope, W. Va., has retired three of its top-level management personnel and a number of supervisors under its new retirement program. **J. M. McCauley,** vice president in charge of personnel since 1951, has retired after 38 yr with the company, starting as mine foreman. **J. E. Howard,** chief engineer, and **E. M. Tutwiler, Sr.,** merchandise manager, retired after 34 and 39 yr of service respectively. Other personnel retired under the plan are: **C. E. Clapper,** auditor in the general office; **J. L. Knight,** scale engineer for all mines; **Harry G. Houtz,** ventilation engineer for all mines; **R. L. Hughes,** payroll auditor for all mines; **C. R. Mandeville,** maintenance foreman for all mines; **C. R. Heermans,** superintendent of machine shop, Mt. Hope; **H. D. Gast,** accountant in general office; **C. A. Toney,** outside foreman at Oakwood mine; **Howard G. McGinley,** chief mine clerk, Summerlee mine; **J. G. Starr,** chief electrician, Skelton mine; **William Butrick,** grade foreman, Lochgelly mine; and **Peter C. Kennedy,** dispatcher, Lochgelly mine.

Philadelphia & Reading Coal & Iron Co., Philadelphia, Pa., has announced several changes among the supervisory personnel. **Joseph B. Maginnis,** superintendent, Alaska colliery, has been named superintendent, Potts colliery, succeeding **W. S. Zartman,** who has become assistant engineer, Locust Summit Div. **William B. Oliver,** superintendent, Reliance colliery, has assumed the added responsibility of superintendent, Alaska colliery, and **Leon Strecker,** outside foreman at Alaska, will also serve in the same capacity at Reliance colliery. **John Chesney,** outside foreman, Reliance colliery, has been made repair foreman at Locust Summit central breaker, succeeding **Arthur Conway,** who has been named night foreman at the breaker. **Clarence Whaite,** superintendent, Hunter tunnel, has been made assistant to the division superintendent, Locust Summit Div., and **Melvin E. Helper,** stripping foreman, Monitor stripping, has been named chief stripping inspector.

The following personnel changes have been announced in the Pennsylvania Department of Mines: **J. V. McKenna,** mine inspector, has been named acting Deputy Secretary of Mines; **Leslie Taylor,** professional engineer, has been made chief strip mine engineer, and **Mrs. M. B. Gutshall,** formerly supervisor of strip mine accounts, has been advanced to administrative assistant to the Secretary. Mr. McKenna will continue as inspector for the 13th Bituminous District.

Oscar L. Chapman, former Secretary of the Interior, has been elected to the board of directors, Pennsylvania Coal & Coke Corp., New York. A cabinet member for more than 10 yr in the previous administrations, Mr. Chapman will act

(*Continued on p 232.*)

Obituaries

Underwood & Underwood

Alexander Bonnyman, 84, president, Blue Diamond Coal Co., Knoxville, Tenn., died April 15. A native of Scotland, he came to this country in 1870 and worked with a number of southeastern railroads, including the L. & E. Ry. and the Louisville & Nashville R.R. for 20 yr. After a successful railroad engineering career, which culminated in the position of general manager of the line through Atlanta, he entered the coal-mining industry, organizing and financing the Blue Diamond Coal Co. in 1915 and opening the Blue Diamond No. 1 mine near Hazard, Ky. At the time of his death, Mr. Bonnyman's interests included 13 mines in Kentucky, Tennessee and Virginia. Mr. Bonnyman's son, Gordon, is general manager of mines for Blue Diamond.

George E. Nettels, 59, vice president and member of the board of directors, Pittsburg & Midway Coal Mining Co., Pittsburg, Kans., died March 20, of a heart attack in Pensacola, Fla. Engaged in coal mining operation since 1922 and widely known throughout the industry, Mr. Nettels previously served as president

(*Continued on p 232.*)

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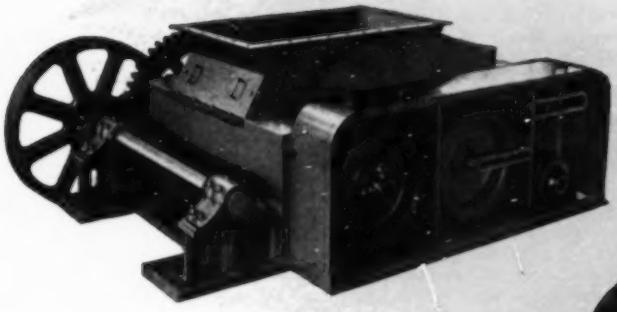
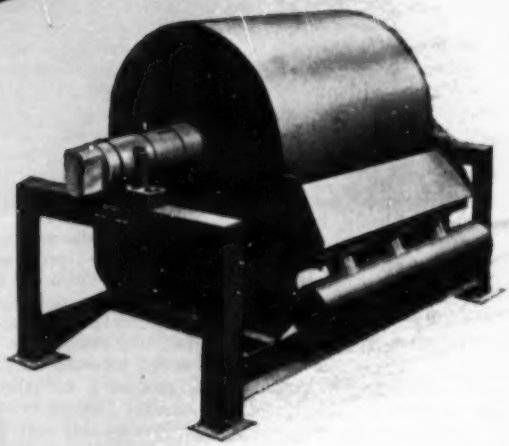


Jeffrey Type SO Magnetic Separator for heavy media operations.



Jeffrey Double Roll 30" x 36" Crusher showing V-Belt drive between rolls.

Jeffrey single section open pan deck MV Conveyor, 18" wide x 15' long.

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New Mine Developments

Large-Scale Stripping Set For Eastern Kentucky

Acquisition of over 12,000 acres of land in Knox County, Kentucky, and plans for development of the property by stripping and auger mining were announced recently by Charles J. Mueller, newly elected president of the Randall Fuel Co., Atlanta. It is expected that the project will be one of the two or three largest of its type in southeastern Kentucky and northern Tennessee, if not developing into the largest in the area. Coal will be processed by the West Virginia Mining & Consulting Co., Princeton, W. Va., headed by C. W. Boone, president, and the actual stripping will be done by the Correale Construction Co., Hazleton, Pa. Coal available on the property is estimated at more than 60 million tons. While output will be predominantly industrial coal, facilities are being installed both for the sale of domestic sizes and for the substantial storage of those sizes.

West Kentucky Coal Plans New 2,000,000-Ton Mine

The West Kentucky Coal Co., Madisonville, Ky., is planning to develop a new mine that will produce 1,500,000 to 2,000,000 tons of coal annually, it was noted recently in the company's annual report. Directors reportedly have authorized expenditures of $3,000,000 for the new development, and construction is scheduled to begin this year. Company officials report that the project is still in the planning stage and that operating and design details are not yet available. The new property is to replace production from other operations expected to be worked out by 1955. The company reportedly holds some 66,000 acres of coal lands in Western Kentucky. Enlargement of the company's board of directors from seven to nine and the election of Cyrus S. Eaton, Cleveland industrialist, and Cyrus Eaton Jr. to the board also were reported.

And For Your Information . . .

The Colorado Fuel & Iron Corp. reported last month that with the completion of its new modern coal washery its coke plant at Pueblo, Colo., had raised coke production 16%. Installed over the last 6 mo without a day's shutdown, the new washery can process up to 3,400 tons of coal per 8-hr shift, with a loss of less than 1% of the coal, the company said.

The Harmar Coal Co. has awarded a contract for the improvement of its barge harbor on the Allegheny River at Harmarville, Pa., to the Contracting Div. of the Dravo Corp. The project consists of installing 25 steel-sheet pile cells, two of which, 26 ft in diameter, will provide foundations for an unloading crane and coal hopper. The other cells in the inner harbor will be built to provide for docking of coal barges. In the outer har-

(*Continued on p 244.*)

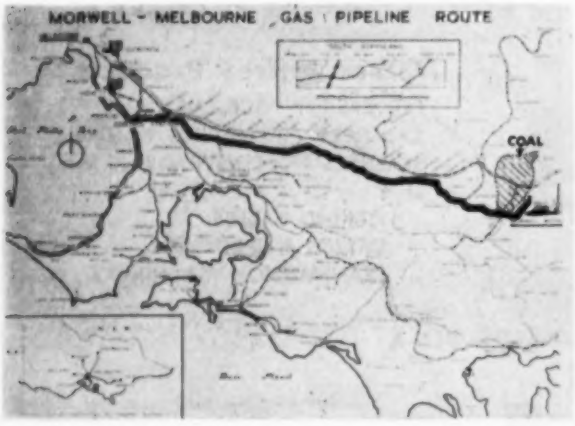
Reduce Anthracite Prices or Face Ruin, LNC Official Repeats

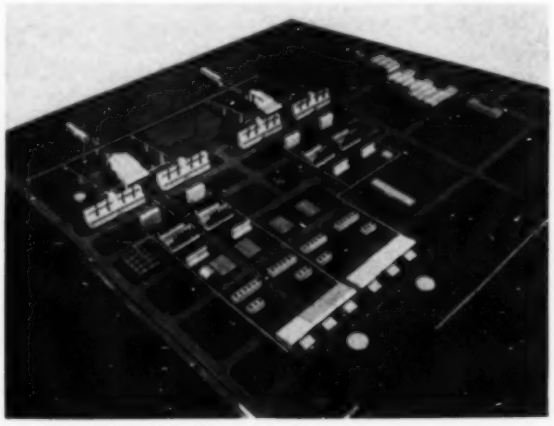
More than 250 coal dealers and their key employees heard Glenn O. Kidd, vice president of the Lehigh Navigation Coal Co., Inc., repeat March 26 his challenge that other producing companies join Lehigh in streamlining operations to produce coal at lower cost. Mr. Kidd told members of the Lehigh Valley Coal Association at their annual dinner meeting in Allentown that lower retail prices must be achieved if the coal industry is to survive.

By eliminating waste and duplication and adapting sales and merchandising methods successfully used in other industries, the delivered price of coal can be reduced by as much as $5 a ton, he asserted. Pointing out that competitive coal producers are now operating identical facilities almost side by side, Mr. Kidd earlier proposed the formation of a single producing company (*Coal Age*, April, p 134). The super-company could operate certain low-cost mines at full capacity while others lay idle and pass operating savings estimated at more than $76 million along to dealers and consumers.

Likewise, if coal dealers use a single yard in each community, and pool their trucks, additional millions can be saved, he pointed out. Every phase of the coal-producing and marketing business must be examined and streamlined, Mr. Kidd asserted. If progressive methods are established at every stage of the industry, coal can compete with other fuels and restore vigor to the industry.

Emphasizing that top executives at Lehigh Navigation are ready to discuss the problem open-mindedly with all concerned, he said: "We sincerely believe this plan is the keynote of an effective long-term program for the industry. It is designed to help everybody associated with the industry, from miner to consumer."





Australians Plan 90-Mi Pipe Line for Gas Made From Coal

GROWING GAS DEMANDS of the City of Melbourne, Australia, will be supplied through a 90-mi welded steel pipe line to be built from the brown-coal field of the Latrobe Valley in southeastern Australia. Gas manufacture by the German Lurgi process is expected to start in 1956 at a new plant to be built at Morwell by the Victoria State Gas & Fuel Corp. Open-cut mining operations and power plants are being doubled in the area, where brown-coal reserves are estimated at 27,000 million tons. In the model of gasification plant planned for Morwell (right), buildings in front flanked by stacks are boiler houses, with generating plants ranged behind them.

Here's your Field-Proved, Mobile Cutter for very Low Vein Coal

. . . the JOY 12-RB Cutter

and here's the rest of the JOY LOW VEIN TEAM

Meet the JOY 12-RB, above . . . the cutter member of the *only* mechanized mining team designed specifically for high-capacity production in very low vein coal. With the Joy 20-BU-1 Loader and 8-SC Shuttle Car, it assures field-proved flexibility and economy never before available to mines operating in extremely thin seams.

The 12-RB is a highly mobile and maneuverable rubber-tired cutting machine only 26" high, supplied either as a top or bottom cutter, and readily convertible. Its high tramming speed and variable hydraulic feed (which provides a cutting rate up to 70 ft. per minute) together permit cutting more places per shift. Bar tilt, roll and lift are hydraulically controlled, and steering is also hydraulic, with a separate motor serving the hydraulic pump.

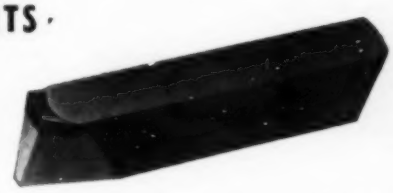
20-BU-1 LOADER ↑ and the 8-SC SHUTTLE CAR →

Only 24" high, yet can load up to 8 tons per minute. Fast tramming, easily maneuverable, features independently driven conveyor and gathering head. While a shuttle car is away, the gathering arms can provide a fully-loaded conveyor ready for quick loading when the car returns. Also permits continued loading even if the gathering arms are momentarily stalled with hard digging.

Features 4-wheel positive drive, 4-wheel hydraulic steering, tapered-end design for minimum turning clearance, height of only 26" and level capacity of 2 tons. Separate motors for traction, conveyor drive, and hydraulic pump drive. Disc-type brakes on all wheels, hydraulic cable reel and hydraulically-adjustable elevating discharge.

SULMET CARBIDE BITS

Joy Sulmet Bits, tipped with sintered tungsten carbide inserts, are made in a variety of types and different degrees of hardness to meet any mining condition. They fit any cutter, and by actual case records, out-perform every other bit on the market.



JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

JOY MANUFACTURING COMPANY, OLIVER BLDG., PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

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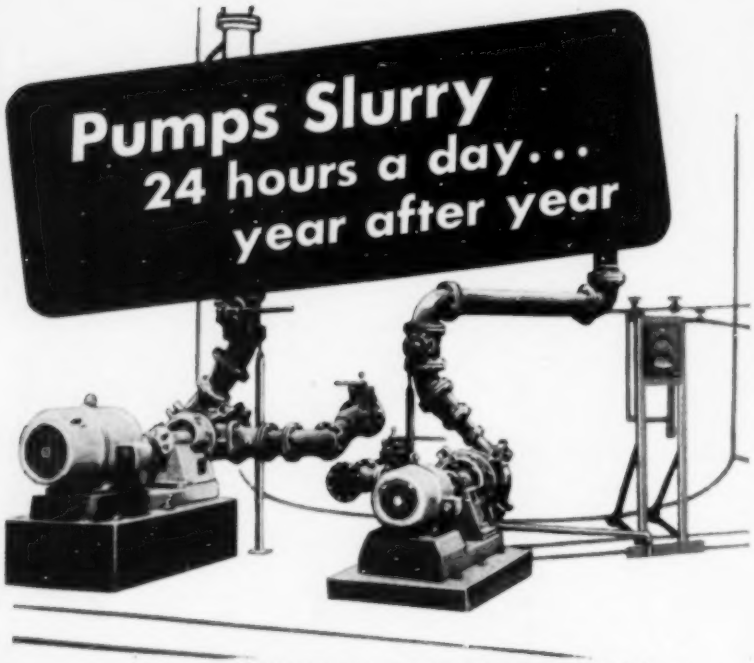


● MORRIS TYPE R SLURRY PUMP at the left is on continuous 24-hr. duty delivering 1000 GPM of a 170° lime slurry at 100' head. Fifty-HP motor operates at 1180 RPM. Intermittent-duty pump at right delivers 200 GPM at 50' head with 7½-HP motor turning at 880 RPM.

In slurry-handling operations, "long-term service" is a meaningless claim unless the pump will work day-in and day-out with a minimum of maintenance time, trouble and expense

Morris Type R Slurry Pumps—with an established reputation for longer life—also incorporate in their design exclusive features which result in easier installation . . . fewer interruptions to service...less overhaul...fewer replacements.

To provide uninterrupted service . . .

The gland is under suction pressure only. This reduces leakage and dilution . . . keeps harsh abrasives out of the stuffing box . . . practically eliminates packing troubles.

There are no internal studs or bolts. Caustic and corrosive solutions cannot seep past threads and cause maintenance headaches.

To make installation and dismantling easy . . .

Shell is interchangeable for right or left hand rotation. Suction and discharge nozzles can be rotated around the axis of the pump to a total of 72 different locations.

Impeller removed without disturbing the piping. You simply loosen 4 *outside* clamping bolts and pull off the end cover. This feature alone saves considerable time and labor.

● *Free Service.* Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send necessary data today . . . include request for Bulletin 181.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Sales Offices in Principal Cities

MORRIS *Centrifugal Pumps*

Utah Student Receives Award

MERLYNN O. ANDERSON (left), selected by the faculty of the University of Utah as the outstanding senior in Mining Engineering, is presented with a gold watch by Dr. L. E. Young, Pittsburgh, on behalf of the Old Timers' Club. Mr. Anderson worked in coal mines in Utah; served in the United States Army; and began his mining education at Carbon College, completing his course at the University of Utah. B. P. Manley, executive secretary, Utah Coal Operators' Association presided at the award luncheon March 23 in the College Union. The group of veteran coal men makes similar presentations to various outstanding mining seniors throughout the country each year.

Broad Program Set for Lehigh Anthracite Meet

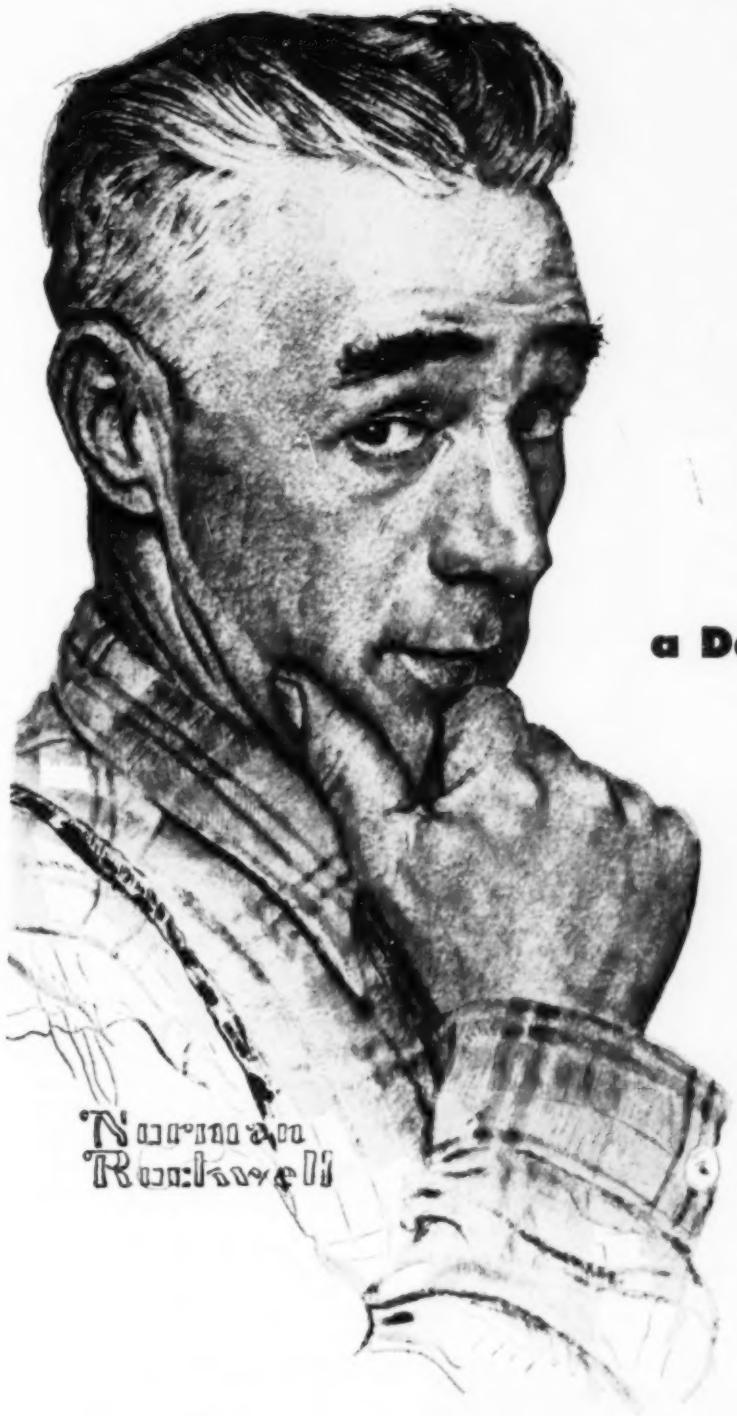
A varied and informative program for the 11th Annual Anthracite Conference, at Lehigh University, May 7-8, has been announced by Dr. Robert T. Gallagher, head, Lehigh Department of Mining, and chairman of the Conference Committee. Sponsored jointly by the university and the Anthracite Institute, the conference will be held in the James Ward Parkard Laboratory of Electrical and Mechanical Engineering, with registration at 10 am on the first morning.

Featured speaker at the annual dinner in the Hotel Bethlehem Thursday evening will be H. D. McGinnis, representative, Explosives Dept., E. I. du Pont de Nemours Co., Inc., a former mine foreman and superintendent.

Speakers and their subjects at the technical sessions include:

THURSDAY, MAY 7

MORNING SESSION — "Pyramid Grates," by Henry K. Eilers, Pyramid Grate Co.; "Stoker Design—A Challenge to the Coal Business," L. C. Dubs, president, Canton Stoker Corp.; "Some Aspects of Air Pollution," Dr. Louis C. McCabe, chief, Fuels and Explosives



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a Doubting Thomas?

IF YOU'RE a man who has to be shown, we're right in your corner. Just give Roebling "Blue Center" Steel Wire Rope one try... see for yourself how it saves time and costs you less on the job.

Two out of three wire rope users in the mining field prefer Roebling rope. Call your nearest Roebling office for a Field Man to suggest the best rope for your purposes.

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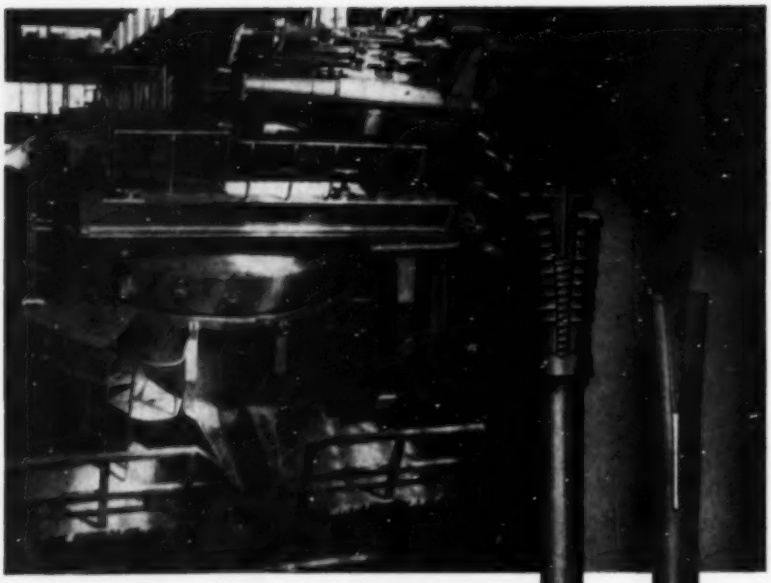


WEST VIRGINIA'S NEW ELECTRIC FURNACE

West Virginia Steel's giant new, multi-million-dollar electric furnace is evidence of the steps being taken continually by West Virginia to bring the mining industry better qualty steel products—trackwork, ties, turnouts, rail, West Virginia roof bolts—for lower maintenance costs, higher economy and greater safety. For *now*, when you specify *West Virginia*, you get steel products *quality controlled* through every step of the way, from raw material to finished product.

WEST VIRGINIA ROOF BOLTS

As an example, West Virginia roof bolts and expansion units, long accepted for safety, economy, dependability and easy, low-cost installation, are now being used in an ever-increasing number of mines for better roof support and freer passageways for haulage and ventilation. Timbering is eliminated. Available in both wedge and expansion sleeve types, complete with all accessories—not "assembly jobs", but manufactured from start to finish from first quality specification steel in West Virginia Steel's modern plant.

Write for information about how West Virginia roof bolts—or any other West Virginia product—can lower your operating costs while giving you at the same time greater efficiency and greater safety.

EQUIPMENT APPROVALS

Nine approvals of permissible equipment were issued by the U. S. Bureau of Mines in March, as follows:

Joy Mfg. Co.—Type 10SC-4PE/PXE cable-reel shuttle car; two 5-hp and three 10-hp motors, 250 v, DC; Approval 2-913; March 3.

Joy Mfg. Co.—Type WL82B Model 50 air compressor; 50-hp motor, 220 v, AC; Approval 2-914; March 4.

Joy Mfg. Co.—Type 20BU2-1E loading machine; two 7½-hp and two 15-hp motors, 250 v, DC; Approval 2-915; March 11.

J. H. Fletcher & Co.—Model DDA-C2-R1 drilling machine; 10-hp motor, 230, 250 and 550 v, DC; Approvals 2-916 and 2-916A; March 12.

Joy Mfg. Co.—Type 10SC-2PF/-PXF cable-reel shuttle car; two 5-hp and three 10-hp motors, 500 v, DC; Approval 2-917A; March 19.

Joy Mfg. Co.—Type 5SC7PE-2 cable-reel shuttle car; three 7½-hp motors, 250 v, DC; Approval 2-918; March 26.

Huwood-Irwin Corp.—Mobile chain conveyor; 15-hp motor, 250 v, DC; Approval 2-919; March 27.

General Electric Co.—Type TLE6-B1, 2, 3, and 4 cable-reel shuttle car; one 3.8 hp, two 5-hp and two 25-hp motors, 250 and 500 v, DC; Approvals 2-920 and 2-920A; March 27.

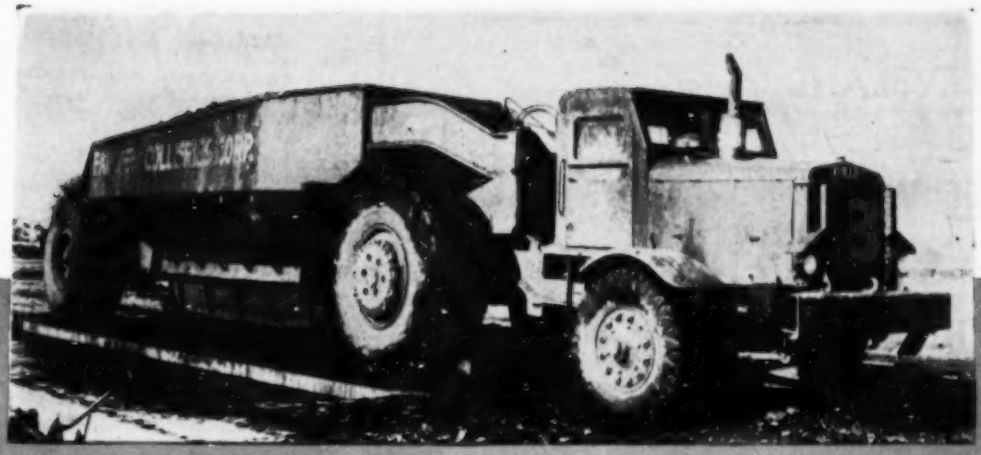
National Mine Service Co.—10-ton diesel locomotive; Approval 2202; March 5. (This is the second approval of a diesel locomotive for use in coal mines by the Bureau of Mines.)

Div., USBM; "Blueprint for Better Advertising," Miss Lillian Cohen, advertising manager, Lehigh Navigation Coal Co., Inc.

AFTERNOON SESSION — "Spectographic Analysis of Anthracite for Trace Elements," Dr. C. C. Wright, chief, Div. of Fuel Technology, Roland C. Nunn, research assistant, and Harold L. Lovell, spectroscopist, Pennsylvania State College; "AnthraAid," Dr. R. C. Johnson, vice president, research, Anthracite Institute; "How to Survive on Stoker Service," Tusten Van Duzer, Motor Stoker Sales Co.; "We Can't Sell Stokers, but We Do," Alan G. Mayer, Toker Coal Co.

FRIDAY, MAY 8

MORNING SESSION—"High Btu Gas from Anthracite," L. L. Newman, gas engineer, Fuels and Explosives Div., USBM; "Active Carbon: Preparation and Application," John W. Hassler, director of research, Industrial Chemical Sales Div., West Virginia Pulp & Paper Co.; "Blending of Anthrafines in Coke Production: 1948-1952," J. Donald Clendenin, chief, Preparation and Utilization Branch, USBM, and Joseph Kohlberg, chief chemist, Great Lakes Carbon Corp.; "Tobacco Curing with Anthracite," Paul



DON'T MISS Euclid at the COAL SHOW!

We're looking forward to seeing you at the big show in Cleveland and hope you'll include the Euclid exhibit on your "must see" list.

If you have any special problems relating to moving coal, overburden and gob, a staff of hauling equipment specialists will be available to provide helpful information and data. You'll want to see the latest Rear-Dump and Bottom-Dump "Eucs" for the coal industry that will be on display. And be sure to get your copy of the new booklet "Estimating Production and Costs of Material Movement with Euclids" . . . it's chock full of useful information for every user of off-the-highway earth moving equipment.

While you're in Cleveland we'd like to show you where and how Euclids are built. A conducted tour of the Euclid plant will be arranged at your convenience . . . just drop in at the Euclid exhibit in upper Lakeside Hall. We'll be looking for you!

THE EUCLID ROAD MACHINERY CO., CLEVELAND 17, OHIO

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

At CLEVELAND

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To SEE WHY

THE STAMLER

HYDRAULIC BARNEY CAR-SPOTTER

1- Gives Increased Production By Eliminating Time Losses Unavoidable With Obsolete Car-Spotting Equipment.

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THE W. R. STAMLER CO.

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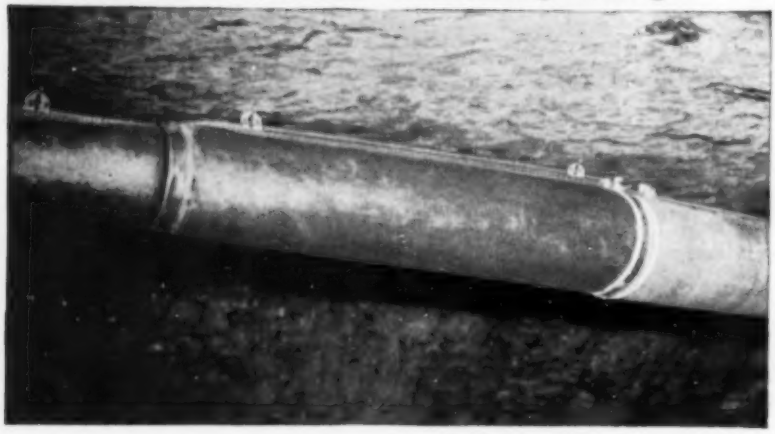
FLEXIPIPE®

{See our exhibit at the Coal Show, Booth No. 935}

the quality ventilating tubing



Flexipipe is now available with Rope Seam Suspension *at no additional cost.* The newest, best, quickest suspension . . . eliminates special accessories and suspension wires . . . *all you need is a nail.* It equalizes strain on the tubing.

Flexipipe is efficient, serviceable, economical. Jute and heavy-duty grades available in a variety of lengths and diameters to meet your requirements.

Write for complete information and sample.

Bemis Bro. Bag Co.

408-O Pine St.,

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COMING MEETINGS

Eleventh Annual Anthracite Conference: May 7-8, Lehigh University, Bethlehem, Pa.

American Mining Congress: Coal Convention and Exposition, May 11-14, Cleveland, Ohio.

Mine Inspectors' Institute of America: 43rd annual convention, June 8-9, Thomas Jefferson Hotel, Birmingham, Ala. (Secretary, C. A. McDowell, 427 Park Ave., California, Pa.)

Rocky Mountain Coal Mining Institute: 49th meeting, June 28-July 1, Colorado Hotel, Glenwood Springs, Colo.

F. White, consulting engineer, Anthracite Institute.

AFTERNOON SESSION — "A Fuel Economy Survey of New York City-Operated Fuel Burning Plants," Kenneth E. Sanger, Percival R. Moses & Associates, consulting engineers; "A Mining Research Program for Anthracite," David J. Crawford, mining research engineer, and W. J. Parton, general manager, Lehigh Navigation Coal Co., Inc.; "Quality Control of Product and Raw Feed," David B. Baird, chief coal inspector, The Philadelphia & Reading Coal & Iron Co.

Association Activities

Pocahontas Operators' Assn. Re-Elects Officers

At the annual meeting in New York, March 27, the Pocahontas Operators' Association re-elected William Beury, president; H. R. Hawthorne, vice president; Henry Warden, treasurer, and B. B. Housman, secretary. Executive-committee members elected were: William Beury, Samuel A. Crozer, J. J. Foster, H. R. Hawthorne, Roland C. Luther, A. R. Matthews, W. W. Walker and Henry Warden. Mr. Crozer, president of the Crozer Coal & Land Co., Philadelphia, fills the vacancy created by the resignation of James A. McQuail.

Safety Council Lowers Injury Rate in Mines

A reduction of 44% in the injury rate—from 136.59 to 76.07 per million manhours—has been achieved in 14 mines making up the Beckley (W. Va.) council of the Holmes Safety Association since organization of the council Sept. 1, 1952. The council's report, issued recently, covered the 5 mo ending Jan. 31, 1953. The Beckley group is organized in three chapters meeting at frequent intervals to analyze accidents and find means of preventing them. The 14 mines had a combined production of over 320,000 tons of coal in January.

Allis-Chalmers HD-15
Weight 27,850 lb.
109 drawbar hp.
GM 6-71 Diesel Engine
Speeds:
6 forward, to 5.8 mph.
3 reverse, to 4.5 mph.

HOW ADVANCED DESIGN

Makes Allis-Chalmers Tractors more dependable

These heavy-duty tractors have toughness and ease of servicing to match their outstanding performance ability. Here are some of the advanced design features that provide extra strength and protection — keep Allis-Chalmers tractors on the job more hours:

1. One-Piece, All-Welded Structural Main Frame . . . strong and firm without a single ounce of excess weight — absorbs all vertical and horizontal stresses.

2. Extra Large Idler and Sprocket eliminates rocking action, puts more track on the ground for greater stability and better traction.

3. Spring-Loaded, Positive Seal keeps dirt, moisture and grime from damaging truck wheels, idlers and support rollers . . . you lubricate them only once every 1,000 hours.

4. All-Steel, Welded A-Frame Track Stabilizer permits free track oscillation, yet keeps tracks rigidly in line and absorbs thrusts and twists from shock loads and working on uneven terrain.

5. Oil Enclosed Track Release Mechanism reduces track maintenance and breakage. An adjustable screw lock provides positive holding action that maintains adjustment at required setting.

6. Engine Not Used as Structural Member — no strain is transmitted to it. Engine weighs less per horsepower developed, because of 2-cycle design — has modern unit injection.

UNIT CONSTRUCTION SAVES SERVICE TIME

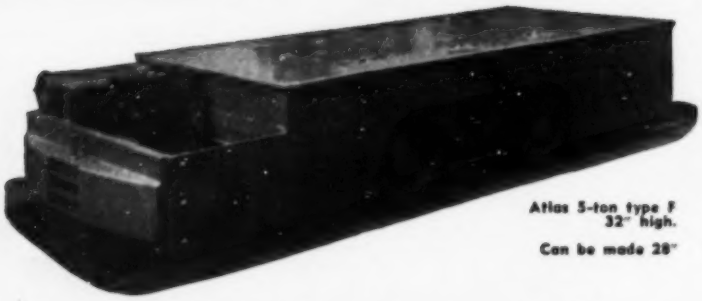
With Allis-Chalmers *unit construction*, major assemblies are easily removed without disturbing related assemblies. This brings real savings in time and money, puts tractors back to work faster. It assures better inspection and maintenance, too. Servicemen find it easy to remove major parts to correct trouble before damage develops.

Let your dealer tell you more about the toughness of Allis-Chalmers tractors, their time-saving unit construction — and their unequalled lugability and work power.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

MOVE MORE COAL AT LESS COST



Atlas 5-ton type F
32" high.
Can be made 28"

The Atlas two-motor 5 ton type F storage battery locomotive is built low to go anywhere mine cars will go. Exposed wheels for easy access. Large battery capacity gives more gathering service per shift. Double reduction spur gear drive in heavy dust-tight housing gives economical maintenance-free service. Ask for details today!

Atlas Engineering service will design locomotives to meet the specific needs of your mine.

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

BOOTH #2200—COAL SHOW

D-A LUBRICANT COMPANY, INC. • Indianapolis 23, Indiana

New Coal-Freight Group Formed

The first meeting of the newly organized Clarksburg Coal Freight Association was held April 7 in Cleveland, Ohio. The group, formed to study the traffic and rate problems involving the Clarksburg district, is composed of coal operators producing better than 5 million tons a year. Member companies include: Compass Coal Co., L. E. Cleghorn, Downing Coal Co., Bitner Fuel Co., Frances Mining Co., Haywood Coal Co., Grafton Coal Co., Wilsonburg Coal Co., C. & C. Coal Co., Gregory & Poole Equipment Co., Pursglove Coal Service Corp., Tasa Coal Co., Simpson Creek Collieries Co. and Yochym Bros. Coal Co. Amos H. Gall, formerly chief, water transportation, storage and terminal facilities, Office of Price Stabilization, is executive secretary of the association, with offices in Washington, D. C. Robert D. Cowen and Jack Routh were elected president and vice president, respectively, and the executive committee members elected were Sam Harrold, Vernon Burt, Harold Collins, Mr. Cowen and Mr. Routh.

NCA Names Air Pollution Advisory Committee

At the request of R. L. Ireland, chairman, NCA Air Purification Committee, an advisory committee has been named to act on coal-industry problems in conjunction with the Air Pollution Control Association. The committee members named were: O. L. Scales, vice president, Enos Coal Mining Co., Indianapolis, Ind., chairman; William H. Ritter, president, Reitz Coal Co., Windber, Pa.; Henry Rose, president, Pittsburgh Coal Co., Library, Pa.; and R. D. Stockdale, vice president, Red Jacket Coal Corp., Columbus, Ohio. NCA also announced the appointment of Edwin H. Davis, chairman of the board, New York Coal Co., Columbus, Ohio, as general chairman of the committee for the 1953 Convention and Business Meeting, to be held in Washington Oct. 19-21.

Anthracite Operators Add Case to Two Committees

At a meeting held in Wilkes-Barre, April 1, Francis O. Case, new president of Glen Alden Coal Co., was elected to membership on the Anthracite Operators' Wage Agreement Committee and the Anthracite Committee of 12. The cooperating producers in the Anthracite Production Control Plan also recommended him for membership, subject to approval by Gov. John S. Fine.

Central Pa. Safety Group Names Keenan for Fifth Term

Central Pennsylvania Safety Association has re-elected Dennis J. Keenan, general superintendent, Sterling Coal Co., Bakerton, Pa., to his fifth consecutive term as president. Other officers named were: Clyde H. Maize, vice president; Joseph C. Leonard, treasurer, and George Resick, secretary.

Foremen Organize Two Chapters

The Mine Foremen's Association of

no matter what your mine locomotives need

National

keeps them running

Complete rebuilding — motor overhauling — controller repairing — continuous-weld tire tread rebuilding — repair of mechanical damage — conversion of split frame motors to solid frame — replacement coils. Anything. Everything.

No matter what it takes to keep your mine locomotive running, National has the "know-how" and the equipment to do the job.

The National Electric Coil Company was born in the coal fields. Since 1917 National engineers have been specialists in your motive power problems. Two National plants — Harlan, Kentucky and Bluefield, West Virginia — are equipped and maintained especially for you.

Drop us a line for the name of your nearby National field engineer. He can help you solve any mine locomotive problem.

See our exhibit at the Coal Show, Booth 2138, Cleveland Auditorium, May 12th to 16th.

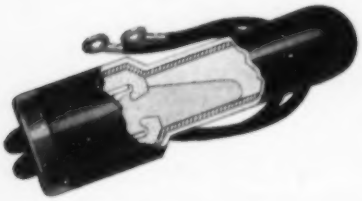
NATIONAL ELECTRIC COIL COMPANY

COLUMBUS 16, OHIO, U. S. A.

TRADE MARK

ELECTRICAL ENGINEERS: MAKERS OF ELECTRICAL COILS AND INSULATION— REDESIGNING AND REPAIRING OF ROTATING ELECTRICAL MACHINES

Durakool
the
STANDARD
of Quality,
Durability and Life



Years of trouble-free performance on the most difficult of assignments have won top recognition for Durakool Mercury Tilt Switches. High temperatures, fast cycling and 24 hour schedules taken in stride. 7 sizes, 1 to 65 amperes. Send for Bulletin 525.

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HIGH
TEMPERATURES

See telephone directory for local distributor or write

DURAKOOL, INC., Elkhart, Indiana

Durakool
ALL-STEEL MERCURY SWITCHES

West Virginia has organized two new chapters in the Beckley (W. Va.) area. Chaper No. 7, organized by foremen at the East Gulf mines, C. H. Mead Coal Co., is headed by C. C. Butcher, president; Louis Moncada, vice president; C. L. Lowe, recording secretary; Clayton Wallace, financial secretary and treasurer; and George Canic, doorkeeper. Tioga Coal Corp. foremen at Tioga No. 5 mine have organized Chapter No. 8, headed by Joseph McSpadden, president; Ed Butler, vice president; Roma Starcher, recording secretary; P. J. Goheen, financial secretary and treasurer; and Charles Gordon, doorkeeper.

COAL MEN ON THE JOB . . .

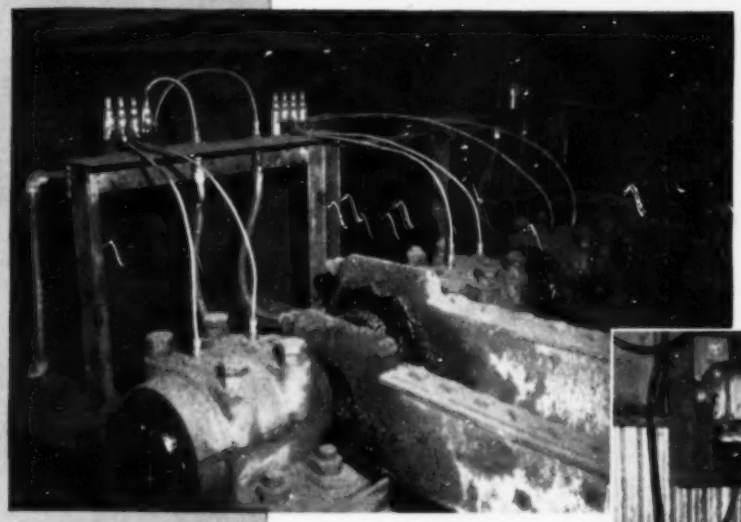
COAL ASSOCIATION SECRETARIES' CONFERENCE, held Washington, D. C., March 19-20, to coordinate legislative and other activities, is addressed by Robert E. Lee Hall (standing), NCA counsel, with John D. Battle (back to camera), assistant tc NCA president, presiding. Others in the picture, left to right, are G. Don Sullivan, staff assistant, NCA Product Promotion Committee; Harry S. Homan, executive secretary, Southern Appalachian Coal Operators' Association; H. J. Goudelock, executive secretary, Midwest Coal Traffic Bureau; Truman E. Johnson, secretary, Northern West Virginia Coal Association; James H. Cunningham, BCI staff; George H. Esser, president, Virginia Coal Operators'; Ezra Van Horn, executive vice president, Ohio Coal Association; C. W. Davis, executive secretary, Big Sandy-Elkhorn Coal Operators'; George S. Ward, secretary, Harlan County Coal Operators'; J. W. Colley, secretary, Logan Coal Operators'; W. C. Gill, president, Coal Producers' Association of Illinois; E. H. Miller, secretary, Ohio Coal Association; Fred S. Wilkey, secretary, Illinois Coal Operators' Association; A. J. Christiansen, secretary, Illinois Coal Strippers' Association and Northern Illinois Coal Trade Association; H. F. Cholet, Belleville Fuels, Inc.; John D. Amos, attorney, Northern West Virginia Coal Association; and Hal M. Scott, secretary, New River Coal Operators' and Winding Gulf Operators' Associations. More than 25 attended the 2-day meeting of regional and local trade executives sponsored by NCA.

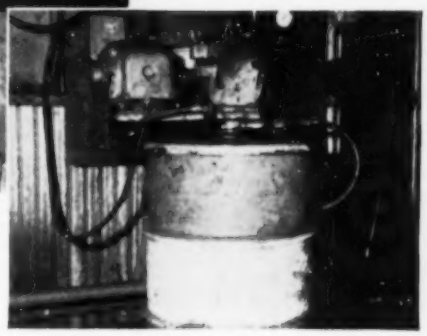
A STATISTICAL-DATA PROGRAM for the bituminous coal industry was under discussion during this session of the coal operators' association executives. At the speakers' table, left to right, are Dr. Ford K. Edwards, director, Bureau of Coal Economics, NCA; Tom Pickett, NCA executive vice president; Laurence E. Tierney, president, Eastern Coal Corp., who is chairman of NCA's Committee on Interstate and Foreign Commerce; George A. Lamb, manager of business surveys, Pittsburgh Consolidation Coal Co., who heads a subcommittee of the NCA Product Promotion Committee; and Roy E. Dean, assistant to president, Ayrshire Collieries Corp., a member of that subcommittee.

242 Bearings LUBRICATED AUTOMATICALLY AT TAMS PLANT OF GULF SMOKELESS COAL CO. with *Lincoln* CENTRALIZED LUBRICANT APPLICATION SYSTEM

Reduce

- DOWNTIME
- LUBRICATION TIME
- LUBRICANT CONSUMPTION
- WEAR AND TEAR ON MACHINERY
- COST PER TON





ELECTRIC DRUM PUMP
dispensing from original refinery container, with Master time clock control, automatically lubricates 158 washing-plant and 84 air-cleaner bearings, including washed-coal screen.

At the Tams Plant, lubricant is pumped directly from the original refinery drums by a Lincoln electric motor operated Lubrigun directly to the bearings. Each bearing gets a measured amount of lubricant — on schedule — automatically. There's no danger of overlooking a bearing — no danger of too little or too much lubricant being applied.

Lincoln Centralized Lubrication Systems apply the RIGHT LUBRICANT — in the RIGHT QUANTITY — at the RIGHT TIME *automatically*, while the machines are in operation.

You can get complete information on Lincoln Centralized Lubrication Systems for the Coal industry from Bulletin 680. **WRITE TODAY.**

See working models of LINCOLN SYSTEMS AT THE **COAL SHOW** Cleveland—BOOTH No. 2614

• • • PIONEER BUILDERS LINCOLN LUBRICATING EQUIPMENT • • •

LINCOLN ENGINEERING CO.
5729 NATURAL BRIDGE AVE.
ST. LOUIS 20, MO.

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

WIDE CONVEYOR OF G-E TRACK LAYING SHUTTLE CAR (END VIEW, ABOVE) GIVES UP TO 30 PER CENT GREATER CARRYING CAPACITY

New G-E shuttle car is well adapted to all types of mining conditions

Plan to see it in action at the Coal show in Cleveland, May 11–14

Here's a timely mining tool you'll want to be sure and see in operation at the 1953 Coal Show in Cleveland, on May 11-14: General Electric's new track laying, cable reel shuttle car.

You have to see it in action to appreciate why it's so well-adapted to all types of mining conditions—wet bottoms, narrow passageways, and sharp turns. Crawler treads make possible greater maneuverability and a 14-ft. turning radius. Ground pressure when empty is just 11 pounds per square inch, or 20 pounds per square inch when fully loaded. Only 42 inches high, G.E.'s shuttle car has a carrying capacity ranging from 190 cubic feet to 300 cubic feet (with 12-inch sideboards). All motors and control devices meet U.S. Bureau of Mines' specifications.

WET BOTTOMS, DRY BOTTOMS—the new G-E shuttle car "delivers the goods." Car above, at Jamison Coal and Coke Co., Hostetter, Pa., easily negotiates mire, sharp turns.

Plan to see the G-E shuttle car in action at the Coal Show at Cleveland. For complete information, contact your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, N.Y. 120-63

You can put your confidence in—

GENERAL ELECTRIC

SWITCH TO GM DIESEL

GM Diesel-powered 1½-yard dragline stripping overburden at Indiana coal mine

FOR MORE WORK AT LOWER COST

Today you can have the extra economy, efficiency and dependability of General Motors Diesel power on *any* job from 16 horsepower up.

This faster-working 2-cycle Diesel is available, for example, as original power in 94 sizes and models of excavators (½-yd. to 4½-yd. capacity) built by 21 different manufacturers.

Two-cycle operation means you get more power from a smaller engine — a Diesel that fits where many others won't. It's smoother, quicker-acting, faster-starting power that "hangs on" to a load and gets more work done on fewer gallons of low-cost fuel.

Clean, simple design makes maintenance easy and economical. Most moving parts are identical for all GM Series 71 engines—2 to 24 cylinders. This feature of interchangeability means parts cost you less and you can protect a whole fleet with a small stock of spares. What's more, you need never worry about replacements or service, for GM Diesel engines and parts are sold through a world-wide organization of distributors and dealers. There is one near you.

These are solid reasons why you find GM Diesel engines so widely used in everything from air compressors to giant shovels, and available as original or replacement power in more than 750 different models of equipment. Your nearest GM Diesel distributor will gladly show you in dollars and cents why *it will pay you to standardize on General Motors Diesel power.*

GM GENERAL MOTORS DIESEL POWER

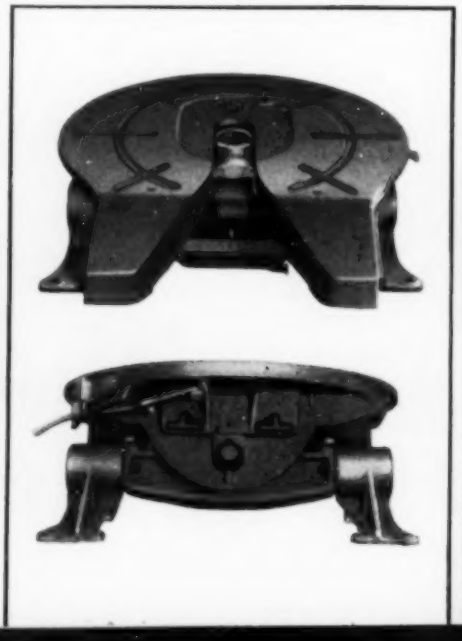
DETROIT DIESEL
ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

Marion shovel, loading a 34-ton coal payload into one of 23 Austin-Western trailers powered by Dart tractors. Scene is at Midland Electric Coal Corporation's strip mine near Farmington, Ill.

ASF Safety 5th Wheels have to be tough to stand up in this heavy-duty service, especially during wet weather when tractors are needed at each end of the semi to get it out of soft ground. Because ASF 5th Wheels are so easy to uncouple, in effect Midland has a *flexible pool* of load-carrying equipment and motive power, rather than 23 separate units. The result is fuller, more efficient use of available equipment.

Back and turn on a dime—In addition to quick interchange between motive power and load-carrying equipment, the tractor-trailer is highly maneuverable. ASF 5th Wheels are side-oscillating: even a full load can be safely and easily jackknifed for a short turning radius.

Heart of the semi—the ASF 5th Wheel—36" extra-heavy-duty ASF Safety 5th Wheel made for the rugged service and heavy loads found in off-highway work. Note the heavily reinforced plate; the massive "I" section center beam; the extra-strong mounting brackets.



He speaks through firsthand experience—M. R. Heckard, Superintendent of Equipment, has used ASF Safety 5th Wheels on all semi's for 11 years. He particularly likes the comparatively new 36" wheel shown at left; feels it will cut maintenance costs to a new low.

The Midland Electric Coal Corporation proves that your best investment for efficient tractor-trailer operation is an ASF Safety 5th Wheel . . .

"Best of all—they're easy to uncouple"

Ease of uncoupling is one of the big reasons why ASF Safety 5th Wheels are standard equipment on the fleet of semi's at Midland Electric Coal Corporation's strip mine near Farmington, Ill. M. R. "Marty" Heckard, Superintendent of Equipment, says:

"We use ASF 5th Wheels on all our semi's, and each wheel takes a real beating during the loading and hauling of a 34-ton payload around 30 times a day.

"One of the main reasons why we like these 5th Wheels is because they are easy to keep free of slack. We just add a shim usually once a year.

"Best of all, however, they are easy to uncouple in a matter of minutes. We can easily shop the tractor for maintenance without the trailer, or vice versa. Working on one at a time makes servicing easier, and we avoid tying up the whole semi."

Quick interchange between motive power and load-carrying equipment is a real asset in mining and quarry work. And there's no denying that you get it with a tractor-trailer. But a 5th wheel—or any hitching device—tends to defeat its purpose if it's hard to uncouple.

Easy uncoupling can save you time, trouble and expense, as it has in this modern strip mine operation. But, it's equally important to know that the ASF Wheel *only uncouples when you want it to uncouple.* This is no beefed-up highway wheel. It's made specially for heavy-duty off-highway service, from the "I" section center beam to the side-oscillating plate that absorbs the sidestrain of uneven roadway. Until a twist of the wrist releases the king-pin, it's built to *stay* coupled—come shocks, strains or high water!

Get the facts on the best 5th wheel investment you can make! See your nearest ASF Distributor, or write: American Steel Foundries, Automotive Division, 410 N. Michigan Avenue, Chicago 11, Ill.

remember this . . . about ASF safety 5th wheels

Largest king-pin bearing area of any 5th wheel . . . Stresses absorbed by a larger bearing area—larger than any other 5th wheel—means longer life for king-pin and jaws.

Shorter king-pin bending leverage . . . Jaws grip the king-pin at the top. The pin *stays straight*—and can't "spring" or disengage.

Side oscillation protects equipment . . . 1½° of free oscillation—plus 5½° controlled by rubber stabilizers—absorbs sidestrain of uneven roadway.

Heavy, cast alloy-steel construction . . . Plate is hinged on strong, rigid "I" beam with big 2" pin. Extra large contact area between plate and beam doubles rocker life. Both rocker and cast-steel bracket are bronze-bushed to cut wear to a minimum.

Easy to maintain in perfect operating condition . . . Wear is inevitable, but on ASF Wheels, it's easily counteracted simply by inserting one or more low-cost shims between buffer and housing front wall. Result? Like-new service, without expensive rebuilding!

A quick glance tells you the lock is LOCKED . . .

LOCKED—as quickly shown by the lever and safety latch—which can *only be in these positions* when the jaws are truly locked.

UNLOCKING—with an easy twist of the wrist. Simply move the safety latch up, and pull the lever forward.

UNLOCKED—ready for uncoupling; parts in lockset position. *Handle can only move back to locked position when the jaws are locked in the next coupling operation!*

A 3,000-pound "compression-grip" saves your maintenance dollars . . .

COUPLING — as the king-pin enters the jaws, the jaws are forced back against the exclusive ASF rubber buffer block, building up compression.

COMPRESSING — 3000 pounds are built up before the lock clears the rear jaw, allowing lock to snap to locked position.

LOCKED—and the jaws *remain* under compression. The grip is like a vise; eliminates the slack and backlash that can cost you money in added 5th wheel and king-pin wear.

—and now TAPER-LOCK

There's only
ONE
TAPER-LOCK

FROM the package to the shaft — ready, *immediately*, for the job! This is the new "off-the-shelf" availability which Dodge brings to roller chain drives. And, with this new availability, you get the important advantages of the famous Taper-Lock principle, proved in millions of V-belt installations.

No more costly and time-consuming boring of sprockets to fit your shafts! *Taper-Lock bushings are available in a range of sizes for the great majority of industrial applications.* And it's not necessary that shafts be turned and ground to get a tight fit. *Taper-Lock not only is keyed to the shaft, but grips it with the firmness of a shrunk-on fit.* Yet when a sprocket is to be replaced, it comes off easily, quickly. The bushing may be re-used.

Taper-Lock sprockets are compact. They have no flange, and no protruding parts. Taper-Lock occupies no more space on the shaft than standard sprockets. The flush design means safety.

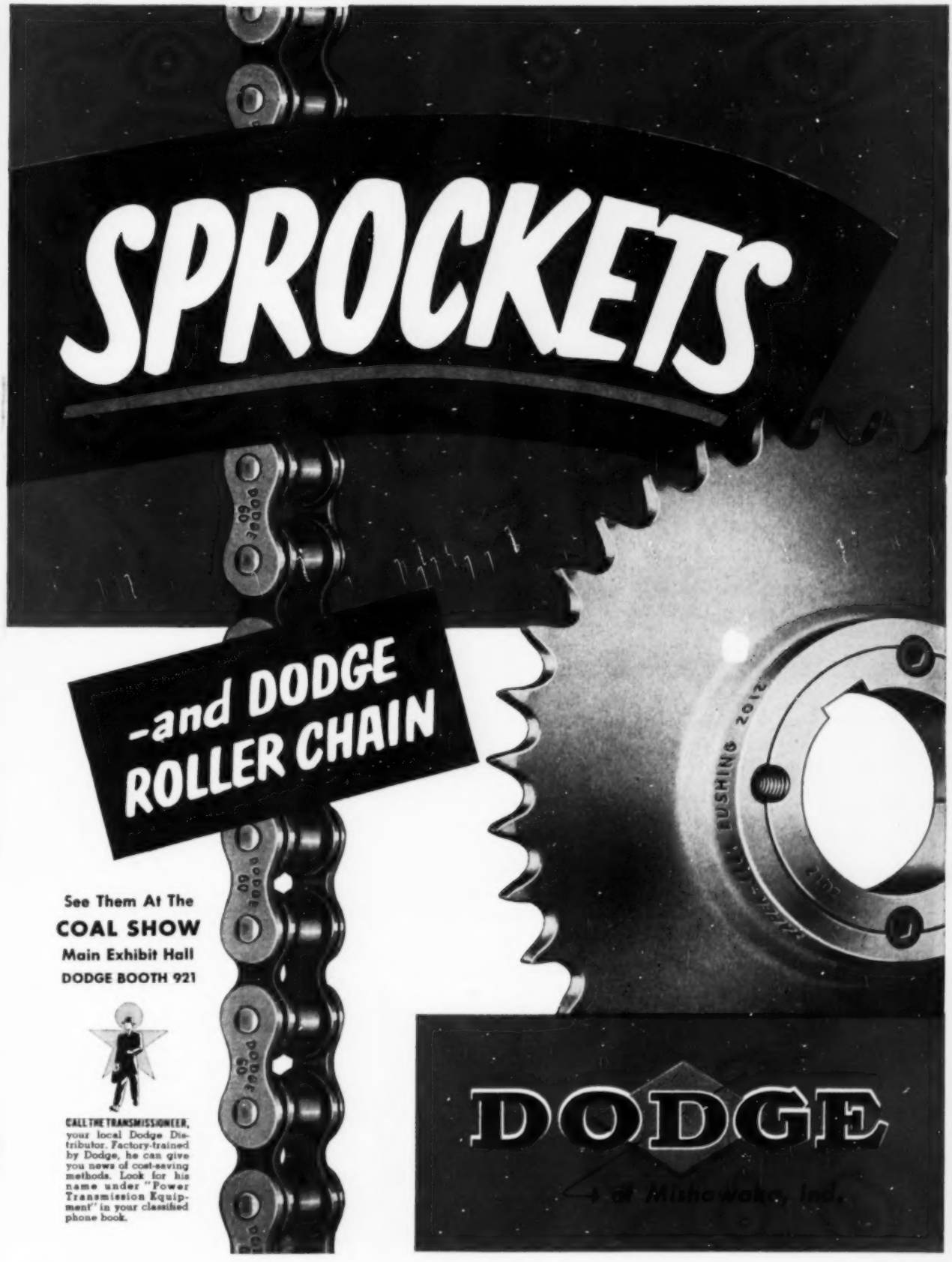
The new Dodge line of roller chain is made to highest quality standards, by craftsmen who know chain manufacture. Both chain and sprockets are made to ASA standards. Taper-Lock sprockets will take any make of American standard chain.

Taper-Lock sprockets will be carried in Distributors' stocks for immediate delivery, in a complete range of B-type steel sprockets—½" to 1¼" pitch. The range in ⅝" pitch, for example, is 12 to 112 teeth.

All bushings and the smaller sizes of sprockets are packaged individually. Dodge roller chain is packaged in 10-foot lengths — and can be furnished in 50-foot and 100-foot reels.

For detailed information about Taper-Lock sprockets and Dodge chain drives write now for Bulletin A-624.

DODGE MANUFACTURING CORPORATION, 3000 Union St., Mishawaka, Indiana


SPROCKETS
-and DODGE ROLLER CHAIN
See Them At The
COAL SHOW
Main Exhibit Hall
DODGE BOOTH 921
CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory-trained by Dodge, he can give you news of cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified phone book.
DODGE
of Mishawaka, Ind.

BETTER SAFETY RECORDS
BETTER HAULAGE RECORDS
for you too -

Savings are yours when you install "COMMERCIAL" Steel Liner Plates in your mine entries, haulage ways and overcasts; and you will obtain a SAFER roof with many advantages.

"COMMERCIAL" plates are light enough to be handled easily; are designed to quickly erect and bolt into an arch which will carry maximum ring thrust.

Perhaps "COMMERCIAL" can help to support your mine roof better, as so many of their installations have been doing over the years. An experienced engineer will gladly respond to your invitation—at no obligation to you.

Don't let inadequate roof support impair the safety of your men and reduce the tonnage of your mine haulage.

THE "COMMERCIAL" SHEARING AND STAMPING COMPANY

NEWS BRIEFS . . From p. 188

Kentucky, Virginia and West Virginia. Cost is estimated at close to $15 million. The hospitals will be located in Harlan, Middlesboro, Whitesburg, Hazard, McDowell and Pikeville, Ky.; Williamson, Man and Beckley, W. Va.; and Wise, Va. Beds will total 1,040. Trustees of the Fund have organized The Memorial Hospital Association of Kentucky, Inc., to build and run the hospitals. J. A. Jones Construction Co., Charlotte, N. C., will erect the buildings.

New Western Kentucky Mine Offers Bonds to Employees

The Uniontown Coal Mining Co. last month received permission from Kentucky State Securities Director H. B. Kinsolving Jr. to sell $1,000,000 of income bonds for refinancing and expansion purposes. The bonds, which are in $500 denominations and bear 10% interest, will be offered only to company employees and a few people living near the company's property, Mr. Kinsolving reported. The company, which is a new subsidiary of the Nashville Coal Co., recently made the first shipments from its new Uniontown (Ky.) mine, slated to produce some 2,000,000 tons annually when in full production. In commenting on the new bond issue, Mr. Kinsolving said: "It is a sort of profit-sharing arrangement, a gesture of interest in employees, and not an offering to the general public." Only one other bond offering in Kentucky with such a high rate of interest was recalled by Mr. Kinsolving, an issue, he said, of the Miners Coal Co. 2 or 3 yr ago. The Miners Coal Co. also is affiliated with the Nashville Coal Co.

Coal Production Reported

1953 bituminous production was down 19.7% and anthracite output down 32.7% through the week ending April 4, as compared with a similar period in 1952, the USBM reported last month. Total 1953 bituminous tonnage through April 4, 1953, was 113,420,000 tons, compared to 141,178,000 tons in the similar 1952 period. In anthracite, output to April 4, 1953, was 7,396,000 tons, as against 10,986,000 tons in 1952.

Prices on Large Anthracite Cut as Smaller Sizes Boosted

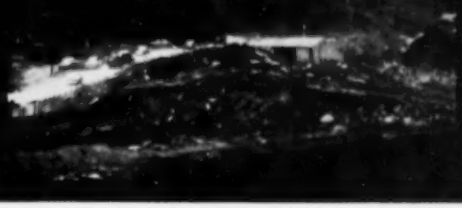
In announcing the usual spring price reductions last month, several major anthracite producers differed from the traditional pricing pattern by increasing prices of smaller sizes while at the same time cutting prices of the larger sizes. The Glen Alden Coal Co. announced April 13 that it was reducing prices of egg, stove, chestnut and pea by $1 to $1.60 a ton, but that it was increasing prices of buckwheat, rice and barley by 30c a ton. Similar reductions were reportedly announced by the Lehigh Valley Coal Co. and the Moffat Coal Co. The Lehigh Navigation Coal Co., in announcing its spring discounts to dealers,

(*Continued on p 214.*)

the inside story

Here's how ROCKMASTER® increases displacement

Final muck pile as seen from the road.



When the contractor or stripping operator says he wants a blast to produce increased displacement he means, "Well broken rock, piled up for easy digging" . . . the way it is in the large photo above. In this tight shot the rock was not thrown high, but it was thoroughly broken and dislocated from its original position.

The height of the final pile shows the increased displacement you can get with ROCKMASTER millisecond delays in an alternate pattern. When the blast is shot the first delays thoroughly stress the burden. Then at the instant of maximum stress, the next delays hit the burden with a churning action that twists and turns the rock. Without this double punch, the rock would tend to drop back into place. This would mean hard, expensive digging at the bottom of the pile even though the top rock might look well broken.

To see how you can profit by using the correct number of the sixteen ROCKMASTER millisecond delay electric blasting caps teamed with the ROCKMASTER system of explosives choice and loading methods, write for your copy of the 20-page ROCKMASTER booklet and a reprint of the paper "OVERBURDEN BLASTING TECHNIQUES."

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE

Offices in principal cities

COAL MEN ON THE JOB . . .

ENOCO COLLIERIES CO., Enoco mine, Bruceville, Ind. (left photo)—Jim Redmond (left), Indiana state mine inspector; John Milligan, section foreman; and Charles Bell, safety director.

STERLING COAL CO., Elmora, Pa. (right photo)—John H. Buck (left), chief electrician; and Thomas J. Lamont, assistant superintendent, in the company's new shop and motor barn.

here's the *New*

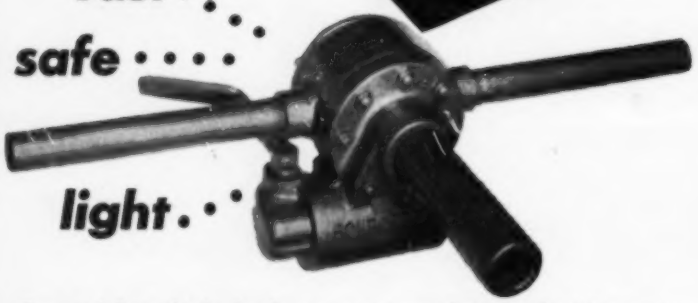
SCHROEDER Coal Drill

HYDRAULIC hand-operated

fast . . .

safe . . . .

light . .



Powered from the hydraulic power system of standard mining equipment, the Schroeder 12-B Coal Drill provides plenty of power for fast drilling with complete operational safety - never any spark, kick, or shock - all electrical hazards are removed yards from the drill! Lightweight and dependable, its design simplicity and minimum of parts result in greatly reduced maintenance costs.

Call or send in coupon today.

Typical FAST HOLES Drilled with the NEW SCHROEDER COAL DRILL

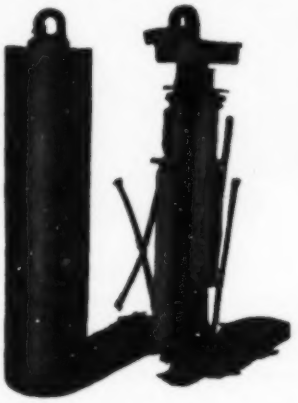
Pittsburgh Seam: 9' x 2" hole . . . . . 23 sec.
Island Creek Seam: 8' x 1¼" hole . . 25 sec.
Freeport Seam: 8' x 3" hole . . . . . 12 sec.

SCHROEDER BROS., 3116 Penn Ave., Pittsburgh 1, Pa.
We are interested in the new Schroeder 12-B Coal Drill
☐ LITERATURE ☐ DEMONSTRATION
NAME: . . . . . .
Position: . . . . . .
Company: . . . . . .
STREET: . . . . . .
CITY: . . . . . Zone . . . . . State . . . . . .

SCHROEDER BROTHERS

HYDRAULIC ELECTRIC & PNEUMATIC MINING EQUIPMENT
3116 PENN AVE. PITTSBURGH 1, PA. EXPRESS 1-1571

SHUTTLE CAR RESISTORS

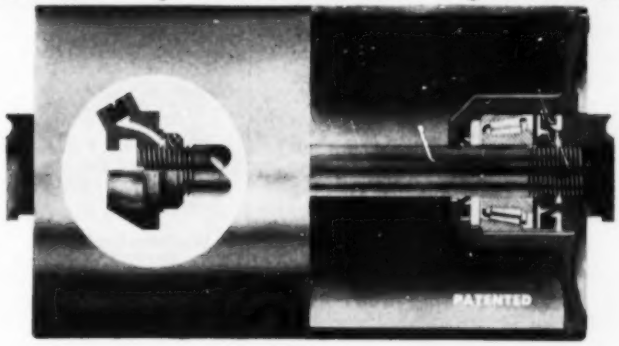


Illustrated. GUYAN replacement elements for permissible shuttle-car traction motors . . . fits in original case and mountings. Resistor available for all type shuttle car traction and reel motors.

GUYAN Try us for long-lived, trouble-free resistors.
MACHINERY COMPANY
LOGAN, WEST VIRGINIA

You Need... CONTINENTAL'S NEW UST Idlers

CGC UNIT-SEALED CGC PRE-LUBRICATED CGC TIMKEN BEARINGS



Saves Grease!
Saves Labor!
Saves Belts!
Long Life - THE ULTIMATE IN MINIMUM MAINTENANCE

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellant grease of a stable consistency with a wide temperature range for long life.

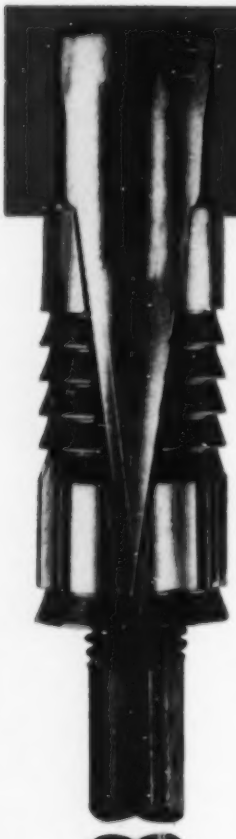
Most important—this construction permits operating the Continental "UST" Idler for extended periods of time without relubrication for 1-2-3 years or longer depending upon the severity or character of conditions.

For detailed information on these idlers write for Bulletin CA-116

CG—5210

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS



The Crux of Dependable Roof Support

The New

PATTIN

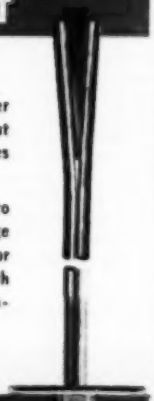
ROOF BOLT

Expansion Shell

With the continuous advance of mechanical mining, roof bolting is rapidly gaining ground. Not only does this type of roof support afford greater safety by reducing roof falls, but also provides greater working areas at the face. The new Pattin Expansion Shell offers the advantage of *double* expansion plus a 3-inch parallel contact with the hole . . . No definite drilling depth is required as the shell can be anchored any place in the hole . . . The PATTIN shell anchors solidly and will not turn while being tightened . . . wedge and shell being locked together prevents loss of parts in handling . . . No special nuts or ears are required on the bolts.

Patent applied for

THE PATTIN SPLIT TYPE BOLT



This is one of the first slotted bolts and is still a favorite wherever split type bolts are used. The bolt is a full 1-inch in diameter with cut threads and is furnished with hex or square nuts and various size plates and wedges.

ALL MINING COMPANIES now bolting, experimenting or planning to roof bolt can depend on PATTIN shells and bolts for better anchorage and reduced bolting cycle time . . . Our engineers are available for consultation and demonstrations . . . We will be pleased to work with you on any present or future roof bolting program. For additional information or demonstration, get in touch with our Marietta office.

Coal Show Booth No. 624

PATTIN MANUFACTURING CO.
MARIETTA • • • OHIO
The Pioneer in Roof Bolting

reduced prices of the four larger sizes up to $1.75 a ton, and reduced buckwheat and rice by 25c a ton.

Schuman Plan Makes Saving of $1 Million in Transport Costs

The six-Nation Coal and Steel Community set up in Europe under the Schuman Plan has saved about $1 million in transportation costs in the first 2 mo of its existence, it was reported at the organization's headquarters in Luxembourg April 14. The common market for coal, iron ore and scrap officially went into effect on Feb. 10. The announcement also stated that a substantial reduction of privileges, prices and subsidiaries had been obtained in France and West Germany since inauguration of the common market.

Coal Company Earnings

Glen Alden Coal Co.—Net income, 1952, $292,000, reduced to net loss of $316,000 by consolidating operating loss of Burns Bros., a sales subsidiary; 1951 net income, $673,000, computed without reference to Burns Bros.

The M. A. Hanna Co.—First quarter of 1953, net profit, $2,000,547, equal to 62c per common share, against net profit of $2,054,859, or 63c per share, in the corresponding quarter, 1952.

Pittston Co.—1952 net profit, $3,283,683, equal to $5.18 per share; net profit in 1951, $1,594,424, or $2.51 per share.

Pocahontas Fuel Co.—Net income, 1952, $1,696,427, or $1.79 per share, against $1,994,327, or $2.21 per share, in 1951.

Westmoreland Coal Co.—Net profit, 1952, $92,207, or 61c per common share, against $458,963, or $3.06 per share, in 1951.

UMWA Agrees to Forget Claim For $2,000,000 in Ky. Suit

In an agreement made at a pre-trial conference in Lexington, Ky., April 1, the UMWA withdrew its claims for $2,000,000 damages in its "reign-of-terror" suit brought 1½ yr ago. The suit, originally instituted in September, 1951, charged 11 specific instances of mistreatment of organizers and coal-company employees to prevent miners from joining the union, and named as defendants some 140 coal companies and officials, county officials and others. The pre-trial agreement leaves only allegations of conspiracy and pleas for injunctive relief for trial. Both sides agreed that the case would be heard without a jury and hearing was set for June 29. Meanwhile, the federal grand jury investigating violence and unrest in the coal fields of Clay and Leslie Counties, Kentucky, was completing its third week of hearings. Some 166 witnesses had been subpoenaed to testify before the jury.

UMWA Hit With 14th Lawsuit In Southwestern Virginia

Two former independent coal operators filed suit April 14 in federal district

"I'm getting another DODGE truck soon!"

Why new DODGE *"Job-Rated"* TRUCKS haul more coal at less cost

BRAWNY POWER WITH BIGGER SAVINGS!

Get the *right* power for lower cost hauling from 7 husky Dodge engines (100 to 171 h.p.)—3 brand-new! Twin carburetion in 2½- through 4-ton models offers extra pulling power and high road speeds, moves loads more efficiently both off and on the highway. All engines have floating oil intakes, 4-ring aluminum-alloy pistons, exhaust valve seat inserts and large cooling capacities to reduce oil, gas and maintenance costs.

BUILT FOR YEARS OF PUNISHMENT!

Dodge trucks are built for big loads and rough roads. Frames are made of tough, hot-rolled steel with ample twist-resisting crossmembers and long, tough springs. Shorter wheelbases, wide front treads and shorter over-all lengths give Dodge unequaled maneuverability and handling ease. And for smooth, sure stops with less pedal pressure, Dodge provides new rear brakes, of the advanced dual-primary-type, in 1- through 4-ton models. Your Dodge dealer is making the kind of deals you can't pass up! See or call him soon!

. . . says **RAYMOND H. HENDERSON,**
Coal Trucker, Honesdale, Pennsylvania

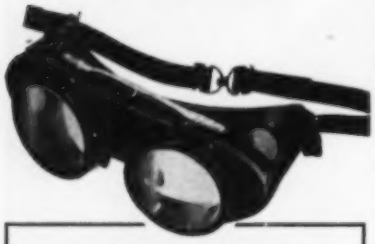
"I've used Dodge '*Job-Rated*' trucks since 1941 because they give me the best results. Take my 1946 Dodge. It's traveled through 200,000 miles of hard, rugged hauling. You'd never think so to look at it though, because it has held up so well.

"My Dodge truck carries top loads of coal each trip. That calls for plenty of power—and I find Dodge power is great!

"Speaking from experience, Dodge is good on maintenance, too. It's also the nicest handling truck I've ever driven; drives like a pleasure car even when it's loaded. I've recommended Dodge trucks to lots of my friends. In fact, I'm getting another Dodge truck soon myself!"

DODGE
"Job-Rated" TRUCKS

NEW WILLSON KOVER-MOR GOGGLES



with strong, lightweight nylon eye cups

Fit easily over modern prescription glasses—use standard 50 mm. round lenses.

They offer many benefits to workers in hazardous occupations—

improved design . . . provides snug, comfortable fit—ample room over modern large-frame prescription glasses.

nylon eye cups . . . molded of tough lightweight nylon—strongest plastic used in goggle cups; non-flammable—and won't conduct heat.

standard lenses . . . 50 mm. round flat Super-Tough® lenses used eliminate need to stock odd size replacement lenses—external lens retaining ring makes lens replacement quick and easy.

extra ventilation . . . two-way ventilation is provided by slots in retaining ring and screens in eye cups.

RIGID METAL TOP BAR—standard on Willson Kover-Mor* Goggles. Makes them easier to handle—holds them firmly in place.

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court, Abingdon, Va., charging the UMWA with "maliciously forcing them out of business" and asking $315,852 in damages. Reportedly, it was the fourteenth suit brought against the UMWA in the area as a result of organizing difficulties. In the current action, F. L. Cantrell and J. M. Dotson claimed that the union agents "maliciously, willingly and wantonly" induced the Clinchfield Coal Corp. to cancel a contract with them for mining of a 107-acre tract of coal they had purchased. As a result, they said, their operation was a financial failure that led to a shutdown. According to reports, the 14 suits pending against the UMWA ask a total of $5,027,740 in damages from the union.

Interior Dept. Will Close Synthetic Fuels Plant

The government-owned synthetic liquid fuel plant at Louisiana, Mo., soon will be closed down, according to announcement April 14 by Interior Secretary Douglas McKay. Mr. McKay said the plant "has produced its maximum" in studies of making gasoline from coal. Further tests will be made in USBM laboratories, he explained. Since 1947, the plant has spent $75,000,000 of an authorized $87,000,000. The closing process will be spread over several months.

Washington Witness Links Self With Sen. Bridges and UMWA

Henry W. (The Dutchman) Grunewald, mysterious figure of Washington "influence" circles now awaiting sentence for contempt of Congress, told tax investigators of the House of Representatives April 13 that Sen. Styles Bridges (R., N. H.) had introduced him to "the lawyer for John L. Lewis" but he declined to tell the investigators what he did for Mr. Lewis. Mr. Grunewald also refused to tell whether he undertook "certain trips and certain inquiries concerning Judge (T. Alan) Goldsborough." Judge Goldsborough in 1946 and 1948 found the UMWA and Mr. Lewis guilty of contempt of court for failing to end coal strikes. Sen. Bridges is a former $35,000 a year trustee of the UMWA Welfare & Retirement Fund. Following testimony three days earlier by Mr. Grunewald, Mr. Lewis denied that he had ever met Mr. Grunewald or knew anything about him.

And For Your Information . . .

The Elk River Coal & Lumber Co., Widen, W. Va., and the independent Employees League of Widen Miners last month signed a new contract containing liberalized welfare and hospitalization benefits and a pay scale "as good or better" than that of the UMWA. Widen was the scene of disturbances last fall when a portion of the workers at the mine attempted to close it down.

Some 60 supervisory officials of the Glen Alden Coal Co. kept the company's Woodward breaker operating when the regular 75-man force walked out in protest over processing coal from other col-

HOW *Much* CAN YOU SAVE BY USING **TRIANGLE** PLASTIC PIPE?

CONSIDER THESE *Facts*

and see what a big difference Triangle Flexible Pipe can mean to you in time and money:

1 IT IS LIGHT. Two 50-foot coils of Triangle Flexible Pipe are so light they can easily be carried by one man.
This means—easy, speedy handling. No abandonment. When finished at one facing, just carry the pipe over to the next one and re-use it.

2 IT IS FLEXIBLE. Finds its own floor. Snakes through crevices. Irregular terrain is no obstacle.
This means—no time wasted in costly bending operations, no involved 90° angle patterns.

3 IT RESISTS CORROSION. Triangle Flexible Pipe is guaranteed against rot, rust and corrosion.
This means—thousands of dollars saved here alone. Why let sulphurous water, alkalis, metallic salts eat away your investment when you can specify Triangle Flexible Plastic Pipe?

4 IT HAS A GREATER RATE OF FLOW. The smooth interior offers less resistance to flow. In addition, there is no clogging because nothing is deposited on the inner walls.
This means—a completely salvable pipe. Use Triangle Flexible Pipe over and over again! It won't clog.

Whether you want Flexible, Semi-Rigid or Rigid Plastic Pipe ask your distributor for Triangle.

Write for new booklet.

PLASTIC PRODUCTS Division

TRIANGLE CONDUIT & CABLE CO., INC.

New Brunswick, New Jersey

TRIANGLE — *Or Must Be Right*

Small Stripper finds the Answer

Thompson Coal Company produces 300 yards per day with an International TD-18A stripping and conveyor loading.

Where one tractor has to do the whole job, International's easy handling and high work capacity make a real difference in daily production.

At the Thompson Coal Company, Matoaka, West Virginia, an International TD-18A handles all the tractor work alone.

Here's what Ray Thompson has to say about it:

"This TD-18A has more power than any other tractor its size I've ever used before. We strip overburden, clean around the shovel and feed coal to loading conveyor with it. It has let us step up production considerably. For a small stripper, it's the answer!"

Whether you strip, with a single tractor or a fleet, let your International Industrial Distributor show you how to get more work done per equipment dollar with International power. He has the facts and the figures on the job International "power that pays" can do for you.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

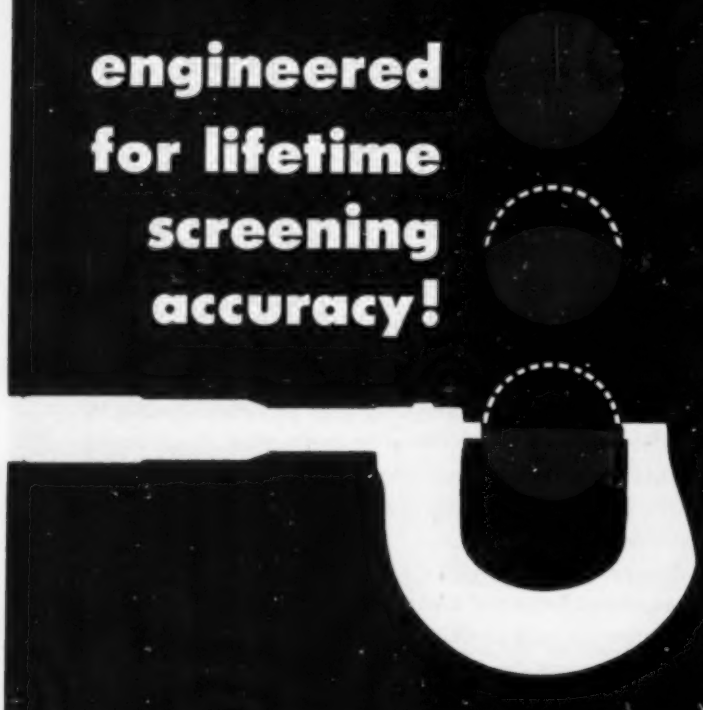
INTERNATIONAL HARVESTER

ONE MAN GANG. Thompson's steady-working International TD-18A is shown stock piling to prepare for conveyor loading of trucks. In addition, this handy tractor strips, makes roads and cleans loading area.

POWER THAT PAYS

SEE YOU AT THE COAL SHOW! We invite you to the IH exhibit in Lower Lakeside Hall, Cleveland auditorium, May 11 to 14, 1953.

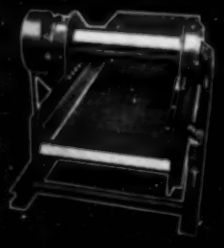
engineered for lifetime screening accuracy!



Wear won't change the size of BEE-ZEE screen openings! You get *accurate screening* during its entire lifetime. Exclusive round rod design makes the difference—whether the screen is new . . . partly worn . . . or near the end of its life-span —the distance between the rods remains the same. This BEE-ZEE feature alone will add months of performance . . . eliminate frequent shutdowns—will *make* you more money!

LONGER LIFETIME

BEE-ZEE Screens are built to last . . . and do —Coal Operators report 10 . . . 20—even 30 —times longer life spans for BEE-ZEE Screens. Built of special alloy stainless steel to withstand shock, abrasive action, rust and corrosion. All-welded construction with built-in tension reduces fatigue from stress and strain.



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BIXBY-ZIMMER
Engineering Co.

lieries while the Woodward colliery remained closed. The local later rescinded a rule prohibiting operation of the breaker when the colliery was idle.

The Communist secretary of the non-Communist British Miners' Union, Arthur Horner, announced April 16 that he planned to go to Russia for medical treatment, at the union's expense. Mr. Horner said he hadn't had a vacation for 14 yr and the trip would give the "complete break from work" he had been told to get.

The British coal industry probably will have an accumulated deficit of some $38,000,000 at the turn of the year, Sir Hubert Houldsworth, National Coal Board chairman, told 2,000 miner and management representatives recently. About $21,000,000 of the deficit is from last year. The conditions cannot be corrected by another price increase and must be corrected by higher efficiency, he said.

Trustees of the Anthracite Health & Welfare Fund have been ordered by the court to pay full pension with interest, retroactive to December, 1950, to a miner who had worked 38 yr continuously in the mines and returned to mining after operating a tavern briefly. He had paid dues and assessments and had been a member in good standing of the UMWA from 1909 until June, 1952. The trustees had held that he was not in good standing because he had operated the tavern from June, 1947, to June, 1950.

An educational advertisement of the Philadelphia & Reading Coal & Iron Co. carrying illustrations of mine explosives saved a group of 10- to 13-yr-old boys from possible serious injury recently. The boys found a rusted tin can containing string-like substances beneath a tree near Potttsville, Pa. One of the boys recognized the articles as dynamite caps and warned the others away. The boys then reported their find to a policeman. The youngster who spotted the caps said that he recognized them from the advertisement.

Shriro Trading Corp. has formed the Shriro Coal Corp. as a division of the parent firm to meet increased needs abroad for quality metallurgical, gas and steam coals from American mines. Much of the new company's effort will be directed at supplying Oriental buyers who now are cut off from coal supplies in China and Manchuria. Eighteen overseas offices will act as selling agents for the firm. Ship-chartering services are provided in New York and London.

A preliminary injunction restraining the UMWA and its agents from interfering with production at mining operations of Robert Bailey, Morrisdale, Pa., has been extended indefinitely by the court.

The Denver & Rio Grande Western R.R. has budgeted $12,000,000 for buying 1,700 gondola cars in 1953. The cars will be used mostly to service coal fields in Carbon and Emery counties, Utah, and in northern Colorado.

President Eisenhower will let Congress

Why this special mine jack will give longer, trouble-free service

See You at
BOOTH 1901
COAL SHOW

When Duff-Norton engineers set out to design safer, longer lasting jacks for men who work in and around coal mines, they discovered one startling fact—about 90% of jack maintenance was in replacing worn springs in the mechanism that controls the jack's raising or lowering action. Result? All Duff-Norton mining jacks are equipped with a patented*, adjustable spring mechanism which assures positive engagement of rack teeth. The spring's tension can be easily adjusted with a screw driver without removing any part of the jack. Should the spring eventually lose its resiliency, there's no need to send the jack to the repair shop. A new, complete spring mechanism assembly can be quickly installed by anyone in a matter of minutes, making the jack as good as new! In fact, as a special service, Duff-Norton distributors carry in stock extra spring mechanisms for all Duff-Norton ratchet lowering jacks.

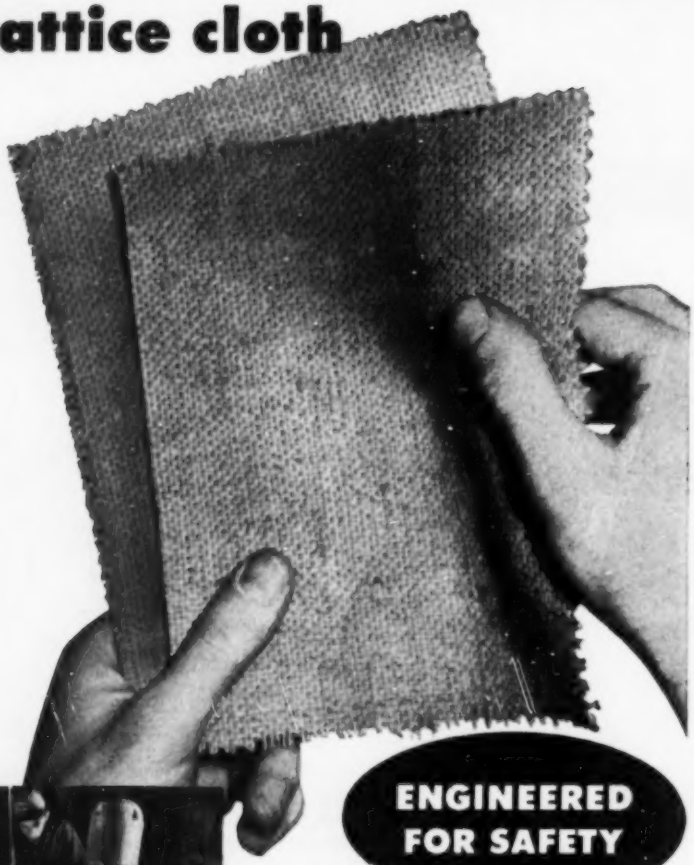
Ask your local distributor or write the world's oldest and largest manufacturers of lifting jacks for a copy of "*A Handy Guide for Selecting Duff-Norton Mine Jacks.*" This colorful, illustrated booklet is full of useful information about all kinds of jacks for coal men. Ask for bulletin AD10-J, The Duff-Norton Manufacturing Co., P.O. Box 1889. Pittsburgh 30, Pa.

The No. 516 MT for medium seam mines is 16 inches high when closed, can raise 5 tons up to 9½ inches.

DUFF-NORTON Jacks

"Giving Industry A Lift Since 1883"

UPSON-WALTON
brattice cloth



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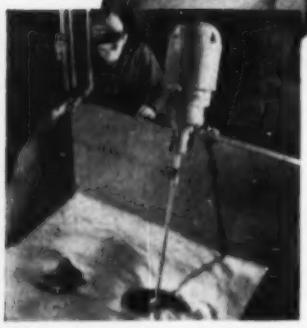

Mixing the flame-retarding chemicals.

Impregnated cloth leaving the drier to be measured, cut, rolled and marked.

- **DRY** because it is dry-proofed. Chemicals used do not absorb nor rely on absorbing moisture to flame-proof.
- **UNIFORM** saturation makes Upson-Walton cloth equally flame-resistant from top to bottom.
- **LIGHTER** by as much as 15%. Lower freight and handling costs.
- **CLEANER** because dry cloth does not pick up dirt as easily, does not wet and soil clothes with irritating chemicals.

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YOU CAN DEPEND ON UPSON-WALTON'S LONG EXPERIENCE—ESTABLISHED 1871

COAL MEN ON THE JOB . . .

R. L. STEARNS JR., president, Stearns Coal & Lumber Co., Stearns, Ky.

take the initiative in decisions on the St. Lawrence seaway and power project, according to Senator Robert A. Taft (R., Ohio). Hearings on the seaway issue were scheduled for the Senate Foreign Relations Committee Apr. 14-16 and for the House Public Works Committee shortly after.

AC Machinery May Force Law Changes, AIEE Told

The trend toward increased mechanization of mining operations and the increased demand for electricity may force a turning to AC electrical equipment and a revision of state laws regulating permissible voltages, the Southern District Meeting of the American Institute of Electrical Engineers, in Lexington, Ky., was told April 22.

Both AC and DC distribution systems have their limitations in mining applications and these "are further magnified by laws limiting utilization voltage maximums," J. Z. Linsenmeyer and A. G. Owen, of the Westinghouse Electric Corp., East Pittsburgh, observed in a technical paper entitled "AC vs DC Power for Underground Mines." "But the trend toward increased mechanization and the demand for electric power at points remote from the power source may gradually force a turning to AC-powered equipment and a revision of mining laws to permit utilization of voltages which are best suited to the needs of the industry, as well as the safety of the equipment-operating personnel," they said.

In 18 states with a published code, they reported, seven limited voltage at the mine face to 300 v, eight made no mention of voltage and three allowed voltages over 300 v under certain circumstances. Application of electric power to underground mining machinery is a highly specialized problem "requiring more rigid restrictions of installation than any other industry," the two engineers said.

TIMBERLIFT®

Brings Low Cost Mechanization To Mine Timbering

UNIT COST IS ONLY $555!

As the boom is brought up, the swivel cradle lifts the timber from the brackets and raises it into position at the roof of the tunnel. The timber illustrated is 11'2" long, 20" in diameter, and weighs 1400 lbs.

Here is a *low-priced,* hand powered hydraulic lift that removes practically all the old-fashioned, back-breaking manual labor in placing overhead timbers in coal mine passageways! This is Ruger's latest engineering development — designed specifically to save important money in an expensive operation.

Here are excerpts from engineering reports at Lehigh Navigation Coal Company, Lansford, Pennsylvania which COAL AGE calls "The Great Great Granddaddy of Them All" (COAL AGE, March 1953, Page 100):

January 30, 1953 — The lift worked very well and undoubtedly saves considerable time and manpower, and makes older men available for timbering who are not capable of lifting collars by hand — February, 1953 — This machine proved its worth with the hoisting of these four collars, whereas with hand hoisting there would be two or three times as many men required and for a longer period of time.

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TIMBERLIFT®

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PATENTS PENDING
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Move rough stuff smoothly!

Quaker

MINE CONVEYOR BELTS

Hard, jagged coal! Giant loads of it! Big chunks, small chunks! Hitting a Quaker Mine Conveyor Belt with violent impacts, day in, day out. Yet—going up long, steep inclines with unwavering smoothness! Quaker belt are *engineered* to withstand "killing" abuse—and give extra-fine performance. Tough covers—resilient, easily troughed, highly flexible in all kinds of weather. For top efficiency, long wear, low cost production—insist on Quaker!

Write for name of nearest distributor

Belting, Hose, Packing and Moulded Rubber of every construction for every need.

QUAKER RUBBER CORPORATION
DIVISION OF H. K. PORTER COMPANY, INC.
OF PITTSBURGH
PHILADELPHIA 24, PA.
Branches in Principal Cities

See us at the Coal Show in Cleveland, May 11-14, Booth 2108

W. Va. School of Mines Sets Short Courses in Coal Mining

The 41st annual short course in coal mining, the third annual short course in coal preparation and the first short course in mine equipment and maintenance will begin Monday, June 1, and continue to July 11, according to an announcement by the School of Mines, West Virginia University. Full information may be secured from the School of Mines, 112 Mineral Industries Bldg., Morgantown, W. Va.

NLRB Cities Three Mines In Kentucky as Unfair

Trial examiners of the National Labor Relations Board in recent weeks have recommended that three different coal companies refrain from interfering with their employees desiring to join a union, in three separate cases growing out of the UMWA organizing drive in Eastern Kentucky. In a recommendation announced in Washington April 10, the New Big Creek Mining Co., Manchester, Clay County, Ky., was asked to refrain from requiring affidavits from employees disavowing the union. The week earlier, it was recommended that the Wooton & Turner Coal Co., Leslie County, refrain from discharging employees to discourage union membership. In March, the examiner recommended that the Phillips Bros. Coal Co. and New Rockhouse Coal Co., Hyden, rehire four employees.

Lawmakers Consider Bills on Land Restoration, Mine Fires

Bills that would permit mineral producers to deduct the cost of restoring land and authorize the Secretary of the Interior to investigate and fight mine fires recently have come before the House of Representatives.

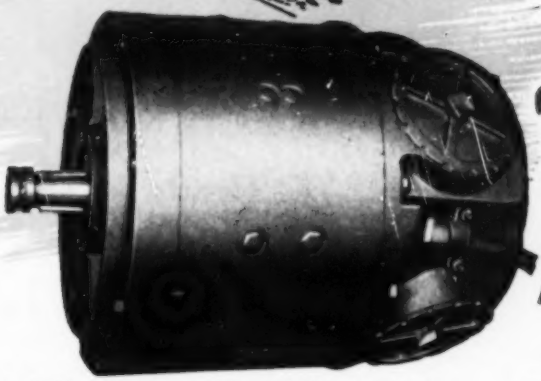
The land-restoration bill, sponsored by Rep. Eberharter (D., Pa.), would allow taxpayers to deduct from gross income, in the year incurred, the cost of replacing overburden and restoring land surfaces. Designated as H.R. 4154, the Eberharter measure would permit the taxpayer, if replacement of overburden is required by law or contract, to deduct a reasonable estimate of the cost on a pro-rata basis as the mineral products are sold. The bill, if made law, would become effective in tax years beginning after Dec. 31, 1952.

The mine-fire bill, already reported favorably by the House Committee on Interior and Insular Affairs, would authorize an appropriation of $500,000 annually for investigating and fighting outcrop and underground mine fires. Projects would be carried out on government-owned and private properties, but government activity would be limited to investigation and research in any privately-owned operating coal mine.

Meanwhile, Rep. C. E. Bennett (D., Fla.) has introduced two bills that would restrict the percentage depletion allowance for natural deposits to the unrecovered cost basis.

My Sweetheart's No Longer "A Mule in The Mine"...

IT'S THE RELIANCE TYPE 'T' HEAVY DUTY



"The Toughest Motor Ever Built!"

Reliance Totally-enclosed, Non-ventilated, Explosion-proof Motor; one of several Reliance motor types especially developed for the mining industry. Reliance Type 'T' Motors are available in ratings from ½ to 100 hp. to meet standards of the Bureau of Mines for use on "permissible" equipment. Low height and compact design satisfy space limitations of underground applications.

See
Precision Balancing of Rotors
... building longer life into Reliance Motors
BOOTHS 1900-2001
CLEVELAND COAL SHOW
MAY 11-14

Write for Bulletin C-2001 describing the complete line of Reliance Type 'T' Motors through 1000 hp.

Wise operators nowadays provide their miners with dependable, economical Reliance Type 'T' Heavy Duty Motors. These rugged motors power 95% of all rubber-tired underground haulage . . . 70% of all coal loaders . . . and increasing numbers of other underground machines performing the toughest jobs in mining.

Type 'T' motors embody refinements developed by Reliance engineers working closely with users in the application of thousands of motors to the coal-mining industry. Especially designed, electrically and mechanically, for difficult underground jobs, Reliance motors have vital parts thoroughly protected against coal dust, moisture and other hazards encountered in the toughest mining jobs. They *stay* clean and dry...last longer with less maintenance.

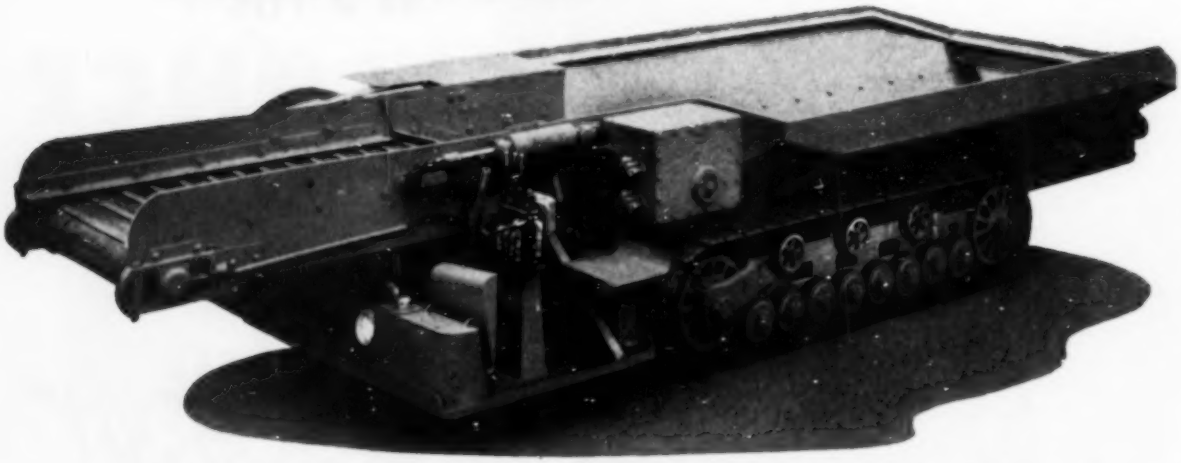
The next time you order new equipment, specify Reliance. See for yourself how these *tough* motors keep production up . . . and costs down. C-1446-A

RELIANCE ELECTRIC AND ENGINEERING CO.

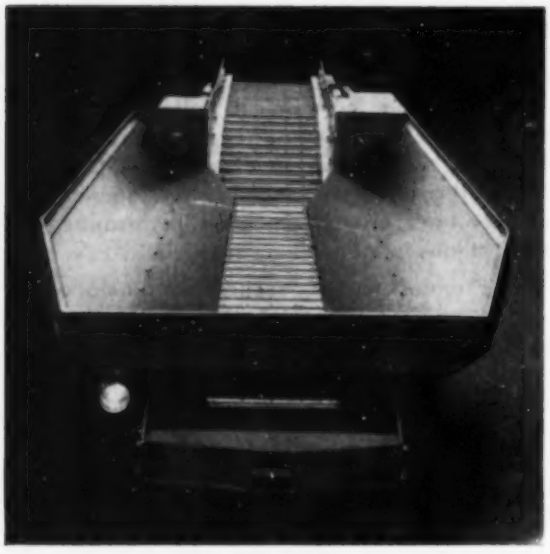
1055 Ivanhoe Road, Cleveland 10, Ohio • *Sales Representatives in Principal Cities*

Announcing

THE WHALEY CRAWLER MOUNTED TRANSFER CAR



ON DISPLAY FOR THE FIRST TIME AT THE MINING CONGRESS—MAY 11-14



SEE THE
Whaley Crawler Transfer Car
Booth 1612 at the Coal Show

After 45 years in the production of loading machines, we are now producing the Whaley Crawler Transfer Car . . . accessory equipment to loaders. The design of our new transfer car has the benefit of these 45 years of experience in producing loading machines. Consequently, there's every indication that it will render the same dependable, low cost service that has proved so advantageous in our Whaley "Automat" Loader—now available in both track and crawler mounting.

Like the "Automat" Loader, our Transfer Car is powered with a single motor. The Transfer Car motor is 20 H.P., continuous rating; 30 H.P., intermittent. Length overall of the machine is approximately 23 feet by 7′ 6″ wide. The basic height is 45¾ inches. With sideboards up to 54¾ inches, capacities range from 250 to 350 cu. ft. crowned to 6 inches.

Like the Whaley "Automat" this car is designed and built to take the punishment of rock work. Consequently, it can be counted on for superior performance in the relatively easier job of handling coal.

MYERS-WHALEY COMPANY

KNOXVILLE TENNESSEE

MARION *invites you to the*

COAL SHOW

In Cleveland, May 11-14

It's Coal Show Time — Don't miss it!

At Cleveland, in a few days, you can get up to date on everything new in the Coal Industry.

You'll see old friends, make new ones, hear experts in every phase of the industry and have time to enjoy a little relaxation away from your day-to-day routine.

Come to Cleveland—see the exhibits —hear the programs—and get yourself set for the big things ahead.

1 CLEVELAND AUDITORIUM
where Coal Show sessions and displays are located.

2 HOTEL STATLER
Euclid at East 12th—Club Room 345 at the Statler will be Marion Power Shovel Company Headquarters for the Coal Show.

See your MARION friends in Cleveland

Make it a point to see your friends from Marion Power Shovel Company at the Coal Show.

MARION will have an exhibit in Booth 1003 in the Cleveland Auditorium.

Marion Power Shovel Company headquarters for the Coal Show will be in Club Room 345 in Hotel Statler. We'll be looking for you.

MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

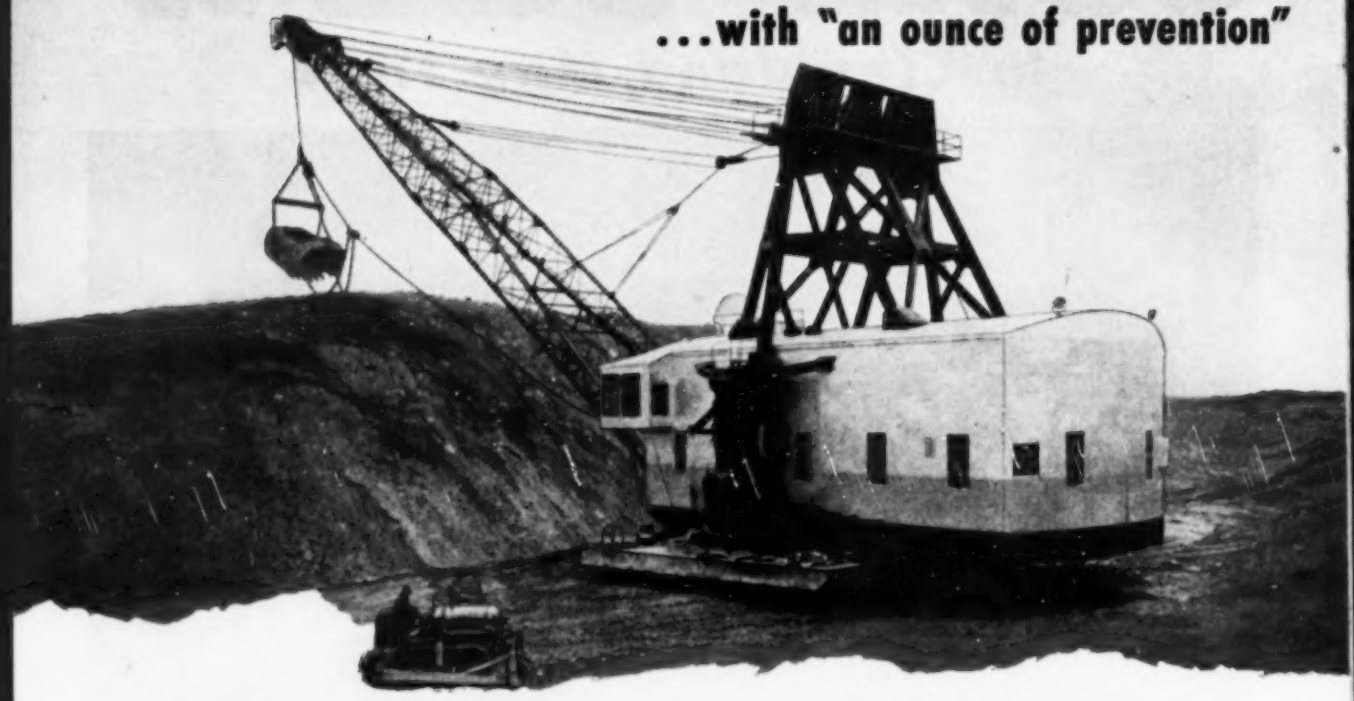
OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

from 3/4 cu. yd. to 45 cu. yds.

Another Alemite "FRICTION FIGHTERS" Achievement!

Soothing a 1600 Ton Giant

...with "an ounce of prevention"



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HELPING VITAL EQUIPMENT PRODUCE MORE...LONGER!

Amazing how the giants of industry can be kept running at top efficiency by modern lubrication methods.

No rest for this giant dragline. 24 hours a day it depends on safe, sure Alemite lubrication. Delivers greater tonnage—at minimum cost—with down-time cut to the bone.

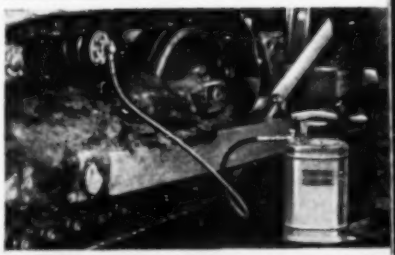
Alemite "Friction Fighters" bring the protection of safe, sure lubrication to trucks, tractors—any equipment—right on the job. Under the toughest job conditions where grit and dirt threaten bearings at every turn Alemite protects vital equipment, keeps it producing at top efficiency year after year—at less cost!

Alemite Protects with Safe, Clean Lubrication Faster!
Above ground or below ground there is Alemite equipment to bring efficiency to the essential job of lubrication—transferring, loading or applying oil or grease. And Alemite delivers the lubricant "refinery clean" from barrel to bearing. You save time—work—money!

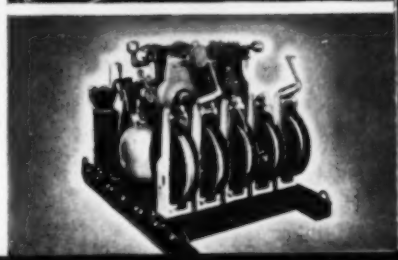
Alemite Reduces Down-Time—Ups Production!
Alemite lubrication methods save man hours, reduce wasted machine time by serving the machine on the job without shutdown. Tonnage goes up, costs go down! Find out how Alemite "Friction Fighters" can work for you, prolonging machine life, saving time, lowering costs per ton.

Here Are Three Ways "Friction Fighters" Can Help You!

Dragline Lubrication—Here is the roller track that carries the massive weight of the dragline, and supports the pull of the tremendous boom, being lubricated with a Model 7137-A "Red-A" Alemite Bucket Pump. Develops 5,000 pounds pressure, provides volume delivery.



Where the going is rugged—You find Alemite lubrication at its best. Here a big volume Alemite Tractor Bucket Pump, Model 6521-B, is used to lubricate the track support rollers of a bulldozer. Delivers lubricant fresh and clean from 35 lb. cap. tank with 3,000 lbs. pressure.



Alemite Portable Service Station—Built to mount on a truck bed, this unit brings lubricants and equipment right to the machine. Air-powered, with famous Alemite "Atomic" pumps, it delivers direct from original 100-pound drums. Sectionalized to fit your specific needs.

ALEMITE

Lubrication Methods that Cut Maintenance Costs

A PRODUCT OF SW STEWART-WARNER

PAYLOADER *WORKS ANYWHERE*

4-WHEEL DRIVE GIVES TRACTION, MOBILITY AND VERSATILITY!

Load! Dig! Backfill! Carry! Spread! Lift! Pull! Push! — all these operations are everyday tasks for big versatile "PAYLOADERS" — makes them valuable for small or large mines — in the pit, at plants, at tipples, in yards.

These "PAYLOADERS" feature large pneumatic tires, 4-wheel-drive, proper weight distribution and power-boosted steer. Other outstanding advantages are full, double-acting hydraulic bucket control and four speeds in *both* directions. They will travel in either direction from a slow, powerful crawl up to 20 miles per hour. Sales *and* Service are available from 200 "PAYLOADER" Distributors in the U. S. and Canada. See yours for full details or write The Frank G. Hough Co., 735 Sunnyside Ave., Libertyville, Ill.

See "PAYLOADER" Tractors and Tractor-Shovels at the COAL SHOW — Booth #1540

Power-boosted steer for easy handling in sand and mud

Big tires and 4-wheel-drive for traction and flotation

Travel Speeds up to 20 MPH

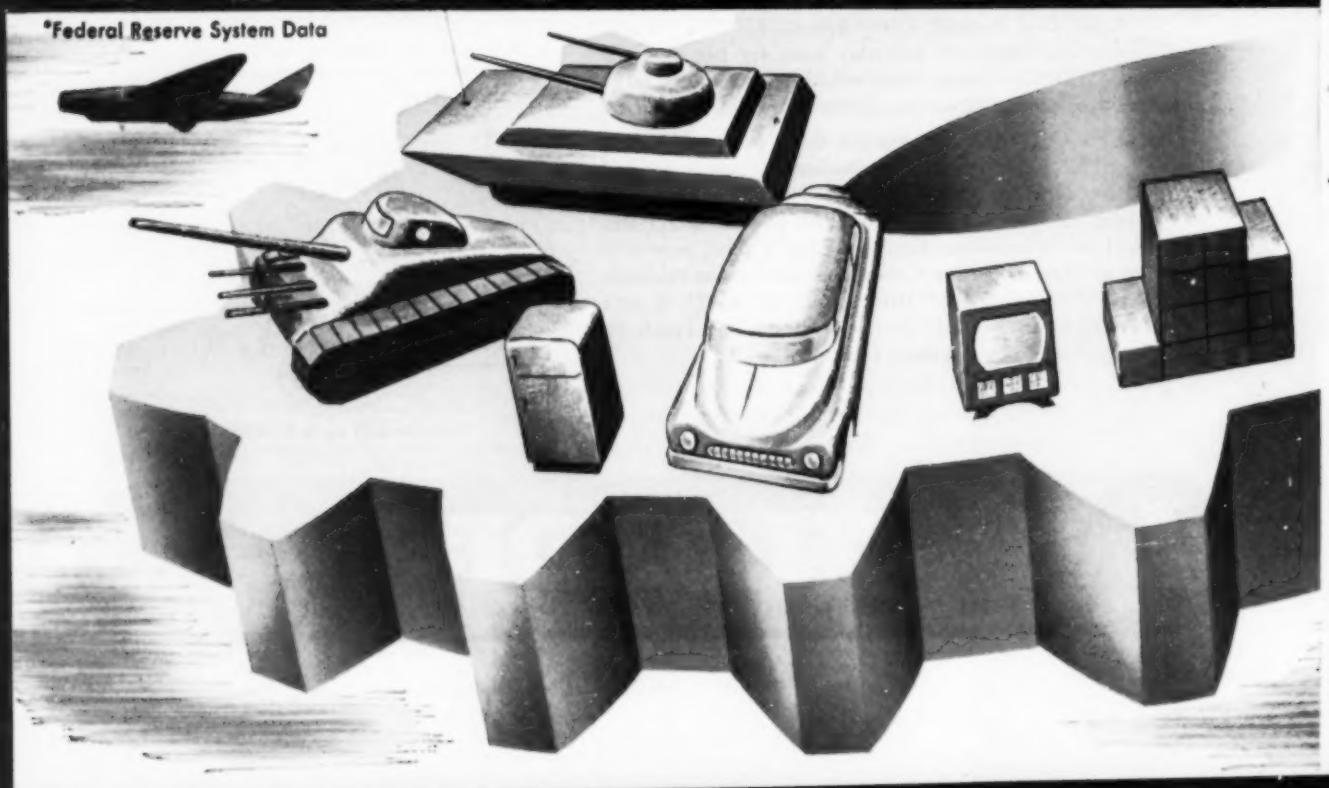
WITH EVER NEW PEAKS IN

GENERAL CABLE SHIPMENTS
FOR USE WITH PRODUCTS PRODUCED

NATIONAL PRODUCTION GROWTH

1944 1945 1946 1947 1948 1949 1950 1951 1952

*Federal Reserve System Data

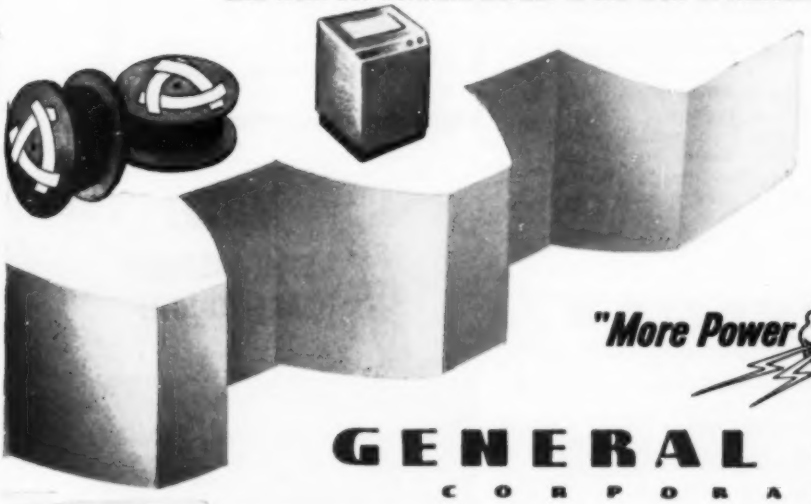


NATIONAL PRODUCTION . . .

GENERAL CABLE

Still means Consistent Dependable Supply

During a 70 year span as a prime supplier of wire and cable to every industry, General Cable's growth has been part of America's ever-mounting national production. Anticipating production trends—with our sights always toward growth—our production is planned for smooth, adequate supply. Evidence is in the thousands of varied wires and cables manufactured in the chain of strategically located General Cable manufacturing plants. Your needs are serviced through our sales offices . . . through our wholesalers . . . from plants, warehouses, and distributor stocks that blanket the country from coast to coast, and from our northern border to the Gulf of Mexico.



"More Power to You"®

GENERAL CABLE
CORPORATION

EXECUTIVE OFFICE: 420 LEXINGTON AVENUE, NEW YORK 17, NEW YORK • SALES OFFICES IN PRINCIPAL CITIES OF THE UNITED STATES

COAL MEN ON THE JOB . . .

Stearns Coal & Lumber Co., Stearns, Ky.

MAURICE BLEVINS (left), general superintendent for the company; Dorsey Cordell, representative, Joy Mfg. Co., Middlesboro, Ky.; and L. A. Wright, superintendent, Mine No. 18, Blue Heron, Ky.

"OLD TIMERS" with the company (right photo)—B. P. Bass (left), chief electrician with 40 yr of service; and W. S. Schick, master mechanic, 46 yr.

Chemicals and Synthetic Fuels Loom in Western Coal Fields

Plans for two coal-processing plants in the West were revealed recently. One project, set for Renton, Wash., involves a $300,000 plant for making industrial carbon and coal tars. The other, involving exploration and development near Craig, Colo., may lead eventually to construction of a $50-million synthetic-fuel plant. At Craig, a power plant first would be built to provide electricity for separating chemicals from coal. The remaining carbon would be used to fire power-plant boilers.

SIGNS IDENTIFY!

. . . SCHOLASTIC ACHIEVEMENT

AUTHORIZED AIRCO DEALER

ONE call
ONE order
ONE invoice
For every welding and cutting need!

TAKE HARDFACING ALLOYS, FOR INSTANCE . . . Your authorized Airco dealer handles more than twenty types of hardfacing rods — to combat abrasion . . . impact . . . heat . . . corrosion. Every type of wear problem! He can show you how one application may add 2 to 25 times longer service life to new or worn parts.

Every item is backed by AIRCO's reputation . . . and delivered promptly to your door!

Whether you want to buy . . . or simply seek information, check your Airco dealer first! Consult your classified phone directory (under Welding Equipment and Supplies) . . . look for this famous sign.

AUTHORIZED AIRCO DEALER

AIR REDUCTION

AIR REDUCTION SALES COMPANY · AIR REDUCTION MAGNOLIA COMPANY
AIR REDUCTION PACIFIC COMPANY
REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
Divisions of Air Reduction Company, Incorporated
Offices in Principal Cities

AT THE FRONTIERS OF PROGRESS YOU'LL FIND

WHEELS

Cast Steel Earthmoving and Mine Car—Completely Engineered and Machined.

For precision production in a modern plant by modern processes—

You can't do better than put your problems up to WEST . . . producers of steel castings of top quality.

WEST STEEL CASTINGS ARE TOUGH!

THE WEST STEEL CASTING CO.
805 E. 70th St., Cleveland 3, Ohio
ENdicott 1-4540

Good records then—better records today!

[*This advertisement appeared in February, 1952*]

Look at these performance records!

★ At a large West Virginia mine, a single-deck scalping screen of Type 410 Stainless Steel has handled 2,368,000 tons of coal and refuse in two years, and is judged to be good for an equal amount of additional service. Supports failed on the screen after two million tons, but the Stainless plates, with their four-inch holes, were in condition to handle many thousands of tons more when the new heavy supports were installed.

★ At another mine, the Stainless bottom deck of a run-of-mine shaker screen has handled 425,000 tons of coal through its ¾-inch perforations. The Stainless screen remains in good condition, ready for much additional service.

★ Just ahead of the picking table at the same mine is another Stainless Steel shaker screen. The ¼-inch Stainless plate with 5-inch perforations has handled 850,000 tons of run-of-mine coal and still looks like new.

*Today!**

4,736,720 tons

810,000 tons

1,630,000 tons

*Figures to January 1, 1953

THESE Stainless Steel screens handling dry, run-of-mine coal had turned in excellent performance records when the advertisement shown above appeared in this magazine in February, 1952. Today the records are even more outstanding.

In each case, the tonnage has nearly doubled from the original figures. And in each case, the screens are still in service . . . still adding tons and tons to these records.

What better evidence can you obtain on Stainless Steel's ability to stand up and maintain hole size under the abrasive wear of hundreds of thousands of tons of coal and rock? And Stainless Steel's resistance to corrosion gets a good share of the credit for this long life with freedom from blinding.

If you are looking for long screen service, with resulting savings in labor, replacements and costly shutdowns, Stainless Steel is your best bet—and for *finest* performance, U·S·S Stainless Steel.

Write for our booklets, "U·S·S Stainless Steel Screens" and "The Sunnyhill Story" which show how Stainless Steel screens can cut preparation plant operating costs. Send your request to United States Steel Corporation, Room 2812-W, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

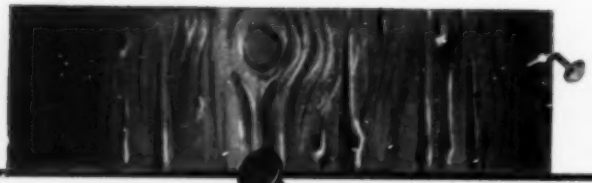
U·S·S STAINLESS STEEL

USS

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

3-1049

UNITED STATES STEEL



Coming to the American Mining Congress COAL SHOW

ROLAGRIP

couplings for plain-end pipe.

Ready to use *right now* with plain-end pipe — no threading, grooving, welding or flanging necessary! In 3 simple steps, anyone can apply a Rolagrip — without special tools or skills. Available in sizes 1½" to 12".

GRUVAGRIP

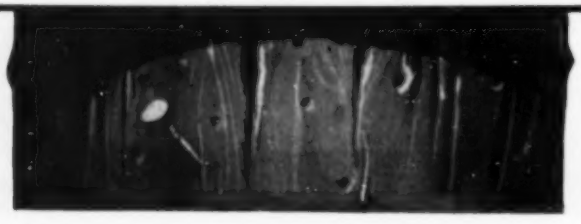
couplings and fittings for grooved pipe.

Exceptionally easy to install and dismantle. Ask for them in sizes ¾" to 14" at your favorite supply store, where you'll also find a complete line of grooved, malleable Gruvagrip fittings.

See them at the Show, Booth 2469, or write today for details on these time-tested couplings.

GUSTIN-BACON MANUFACTURING CO.

210 W. 10th St. Kansas City, Mo.



OBITUARIES . . . From p 190

of the Southwestern Coal Operators' Association and was a member of the Kansas Professional Engineers and the Land Use Committee of the National Coal Association. A graduate of the University of Kansas and long active in university and civic affairs, Mr. Nettels was past Commander of the Benjamin Fuller Post of the American Legion, and served 8 yr on the Pittsburg Board of Education.

Charles F. Hosford Jr., 65, lawyer and former coal-company executive, died April 12 at his home in San Francisco, Calif. A graduate of Harvard Law School in 1911, he practiced law prior to becoming president of the Butler Consolidated Coal Co. in 1923, a position he held for 8 yr. He served as director of the Coal Control Association of Western Pennsylvania and in 1937 was named chairman of the National Bituminous Coal Commission, set up by the government. Mr. Hosford served as president of the Pennsylvania Coal Products Co. until its consolidation in 1947 with the chemical division of Koppers Co., Inc., at which time he was named vice president of the division. Recently he had been president of the Nassau Chemical Co. in California.

Benjamin Davis, 74, superintendent, Cannelton Coal & Coke Co. for 22 yr until his retirement in 1943, died April 9 in Miami, Fla. An early union organizer in the southern West Virginia coal fields, and president of District 17, UMWA, he was later president of the Kanawha Valley Mining Institute.

Austin J. King, 78, recently associated with Truax-Traer Coal Co., died April 8 at his home in Huntington, W. Va., after a prolonged illness. A prominent figure in the coal-mining industry, he was associated with H. C. Frick Coal & Coke Co., later was chief engineer and assistant general superintendent of the Southwest Virginia Improvement Co., becoming general superintendent of that company in 1901. In 1903 he became general superintendent of the Virginia Iron, Coal & Coke Co. In 1904 he was made general superintendent, James W. Ellsworth Co., and was chief engineer, New River Smokeless Coal Co., before becoming assistant chief inspector, West Virginia Department of Mines for some months in 1909. Beginning in 1911, Mr. King developed various properties of his own in Logan County.

PERSONALS . . . From p 190

as consultant on problems involving company development of natural resources.

Louis A. Turnbull and **Russell E. Morgan**, attached to the USBM Washington office, are undertaking a survey of Philippine coal deposits to determine the feasibility of expanding coal production there, at the request of the Philippine government and the Mutual Security Agency. Mr. Turnbull, with the Bureau of Mines since 1941, has conducted coal

McCarthy drills CUT DRILLING COSTS

BLAST HOLE DRILLS

At Bessemer Limestone and Cement Co., Bessemer, Pa., one McCarthy Blast Hole Drill, like the one pictured below, averaged 90 ft. an hour, working through a hard blue shale facing 34 ft. deep. Holes were drilled on 18 ft. centers. Two men handled the whole job, including set-up and moving. Bessemer officials were so pleased with the performance of the McCarthy Drill that a second one was ordered and put to work in another section of their quarry. It, too, is breaking all previous records for fast, low-cost shot hole drilling.

Heavy Rugged Powerful

McCarthy
Model 106 Vertical Drill

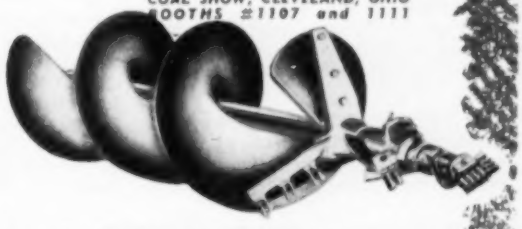
COAL RECOVERY DRILLS

McCarthy 36" Coal
Recovery Drill

Near Salineville, Ohio, a three-man crew, operating a McCarthy Coal Recovery Drill, similar to the one shown above, produced 90 tons of clean, high-grade and profitable coal in one eight-hour day. At Germano, Ohio, a three-man crew, using a 36" diameter auger section, produced 167 tons of coal in one eight-hour day!

Hydraulically controlled and operating on gasoline, diesel or electric power, rugged McCarthy Coal Recovery Drills produce coal at $1.50 to $2.00 a ton, including amortization of investment cost. You can select from four models . . . 20" to 24", 30" to 36", 42" and 48" diameters with 4-ft. to 24-ft. auger sections. Write Salem Tool direct and a distributor will call on you.

VISIT WITH US AT THE COAL SHOW, CLEVELAND, OHIO BOOTHS #1107 and 1111



THE SALEM TOOL COMPANY

763 S. ELLSWORTH AVE. SALEM, OHIO, U. S. A.

Self-propelled high-wall Blast Hole Drill

SALEM

24" Coal Recovery Drill

Radio Contact ***keeps all construction equipment rolling. Cuts lost time. Saves manpower and money.*** Read what it can do for you.

Now...RCA 2-way radio

speeds up construction

...it can help your business too

Do you operate . . . Field crews?
Trucks, buses, or taxis?
Pipe lines or power lines?
Lumber camps or strip mines?
Materials handling operations?

IF SO, YOU'RE LOSING A LOT if you don't look into RCA 2-way radio. It puts a "phone" in every truck or car. Lets you contact any vehicle in the field *instantly . . . by radio.*

No more aimless driving

Radio directs field forces from job to job. Saves gas and oil, wear and tear. *Saves precious time in emergencies.* Field crews cover area more efficiently. You need fewer trucks, less equipment.

You're always in touch with office

When you're driving in the field, you're still in touch with office and with field men, too. You cut costly phone bills. And you can always be reached if needed.

Easy to install—operate—maintain

RCA helps you set up your 2-way radio system. Includes field survey (usually no charge), help with FCC permit, help with installation. And RCA Service Company handles service and maintenance on contract basis if desired.

Get full story . . . mail coupon NOW

Dept. 136Q, RCA Engineering Products, Camden, N. J.

Please send me my FREE copy of illustrated booklet on how RCA 2-way radio can help me in my business checked below:

☐ General Industry (Utilities, Construction, Petroleum, Lumber, Mining, etc.)
☐ Transportation (Truck, Bus, Taxi, etc.)
☐ Public safety (Police, Fire, Ranger, etc.)

Name _____ Title _____

Company _____

Address _____ City _____ State _____

RCA **RADIO CORPORATION of AMERICA**

mining investigations in Mexico and Alaska. Mr. Morgan, a graduate of Lafayette College, joined the Bureau in 1944.

Dr. Alex B. Shipley, regional director for east Tennessee, Tennessee State Health Department, for the past 18 yr, has resigned to become associate director of the UMWA Welfare Fund, at Louisville, Ky.

Paul O. Kock, chairman of the physics department of the Ohio Mechanics Institute for the past 6 yr, has joined the Columbus, Ohio, staff of Bituminous Coal Research, Inc., assigned to research and development on projects relating to industrial heat and power.

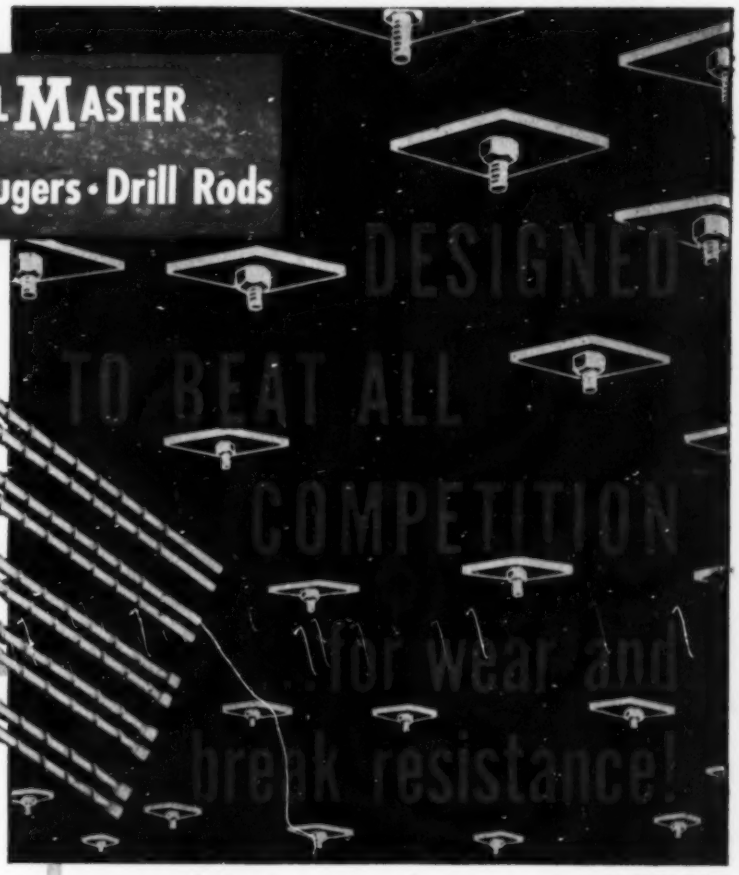
Iowa Blast Takes Five Lives

An explosion March 30 in the shaft mine of O'Brien Coal Co., Lovilia, Iowa, killed two men outright and later took the lives of three men in an inspection party of five that entered the mine several hours after the blast. At the time of the explosion, the two miners were the only men in the mine. An inspector said they had been blasting coal with black powder. The two survivors of the inspection party stumbled to the mine portal and told how their companions had been overcome by poisonous gases. Earlier, on March 19, the Iowa Senate passed a resolution asking Congress to exempt the state from the black-powder ban in the Federal Coal Mine Safety Act of 1952.

Electrician Cited for Safety

ANOTHER BLUE DIAMOND safety record was marked up by Ballard Taylor (above), chief electrician, Leatherwood mine, Blue Diamond Coal Co., Leatherwood, Ky., according to a report by William B. Wright, safety foreman. Mr. Taylor and the men under his supervision have worked a total of 490,945 man-hours from January, 1948, to November, 1952, without a lost-time injury.

NEW COALMASTER ROOFBOLTER Augers • Drill Rods



STANDARD SHANK for
- Baker-Fletcher
- Chicago-Pneumatic
- Jeffrey, Joy and other Shanks furnished in welded construction

STANDARD SOCKET for any make bit, as
- Kennametal
- Sulmet
- Firthite
- Carboloy

ANY LENGTH from 12" to 84"
(longer on request)

...and here are 3 reasons WHY!

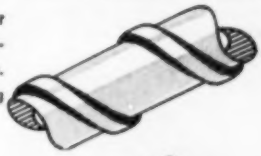
1 **ONE-PIECE, NON-WELD CONSTRUCTION.** Shanks and sockets are both an integral part of every Coalmaster Auger or Drill Rod—fashioned right from the same piece of steel (not welded as in other competitive makes). The result: the most rugged durability possible, for either wet or dry drilling, with minimum loss due to breakage.

SHANK FOR B. F. DRILL

SHANK FOR C. P. DRILL

2 **HEAVY-DUTY TUBING.** Husky-walled seamless steel tubing throughout . . . a high-tensile alloy, heat treated for maximum performance.

3 **SPIR-L-WELD FLIGHT.** An exclusive Coalmaster feature . . . smooth, non-clog design for producing a clean, accurate hole—without drag or jam. Sharply speeds up production time, cuts operating costs, at each hole.



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DRILLING COALMASTER TOOLS

CENTRAL MINE EQUIPMENT COMPANY

ST. LOUIS 15, MO.

COAL MEN ON THE JOB . . .

FENTRESS COAL & COKE CO., Mine No. 7, Monterey, Putnam County, Tenn. (left photo)—T. J. Wheeldin (left), representative, Sulmet Bit Dept., Joy Mfg. Co., Middlesboro, Ky.; A. B. Adkins, general manager, Fentress C&C; S. R. Wright, chief electrician; and H. J. Stephens, superintendent.

BURNING SPRINGS COLLIERIES CO., Kermit, W. Va. (right photo)—T. W. Lambert (seated, left), general mine foreman; Joe Newman, night mine foreman; T. D. Dearnell (standing, left), bookkeeper; and Ernest Chapman, mine electrician.

NOLAN

ROTARY CAR DUMPS keep coal coming faster

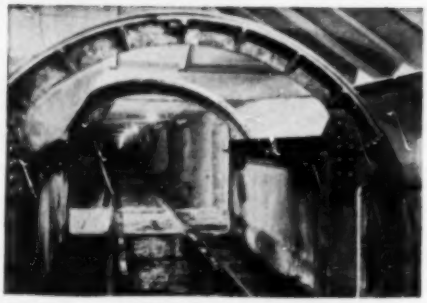
More and more, the quick, safe handling of coal is imperative for profitable operation.

Many mines throughout the country are attaining new high efficiency in coal production with the Nolan Rotary Car Dump. Distinctive features include:

1. Gear Drive or Direct Traction Drive with Patented Positive Starting Lug
2. Patented Positive Rail Aligning Stop
3. Heavy Machined Steel Rings

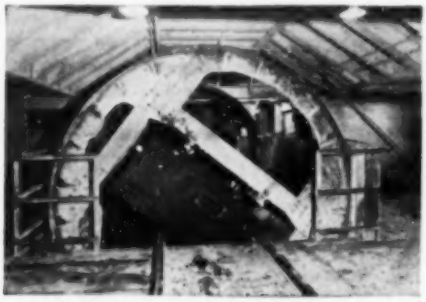
There are many other quality engineering advantages built into the Nolan Rotary Car Dump—features that encourage better, safer, speedier coal delivery, at lower costs.

Write for illustrated catalog giving complete details, and ask us to help solve your problems through our long experience in car control and dumping operations.



Heavy Cage Assembly with machined cast steel rings. Rails positively aligned by "Patented" Rail Aligning Stop.

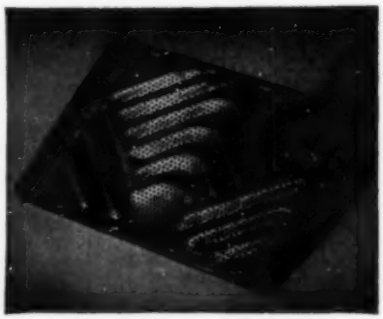
Push Button Starting. Dump starts slowly—no slipping—then rotates at higher speed for quick cycle.



Dump slows down for stopping—no jar—rail aligning stop is automatic.

NOLAN

THE NOLAN COMPANY 106 PENNSYLVANIA ST. BOWERSTON, OHIO



"W" DENTED SHAKER SCREENS

A "must" when it comes to obtaining an efficient job! *Good* because the spreading and collecting riffles give uniform spread of material over the entire screen surface . . turns the top and middle flow of material down in direct contact with the screen . . . gives an increased screening efficiency up to 33% on fine sizes over an undented flat screen.

Comes in Carbon and Stainless Steels and Manganese Bronze. No sag.

Write us today. We shall reply promptly.

REMALY MANUFACTURING CO., INC.
TAMAQUA, PA.

The Full Length Grip

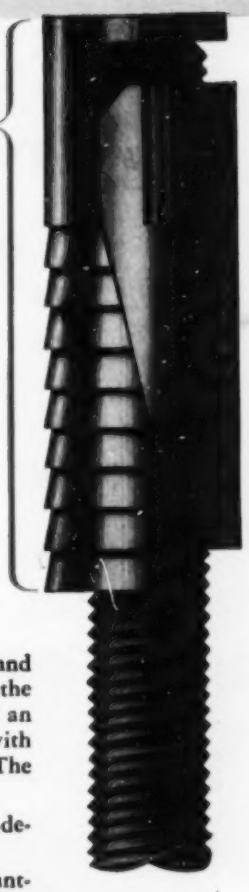
GIVES

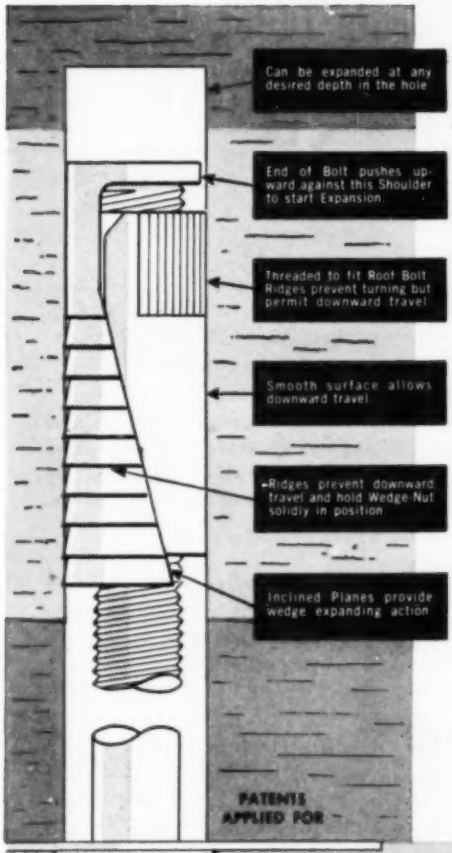
Greater Holding Power

TO THE

HUBBARD Parallel Expansion

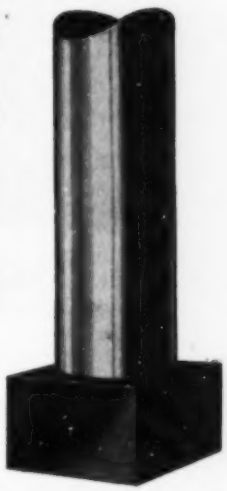
ROOF BOLT




Can be expanded at any desired depth in the hole
End of Bolt pushes upward against this Shoulder to start Expansion
Threaded to fit Roof Bolt Ridges prevent turning but permit downward travel
Smooth surface allows downward travel
Ridges prevent downward travel and hold Wedge-Nut solidly in position
Inclined Planes provide wedge expanding action
PATENTS APPLIED FOR

AS the Hubbard Roof Bolt is turned and the wedge-nut or shell is expanded the two sections remain parallel, exerting an even pressure on the sides of the hole, with both sections of the shell fully engaged. The unique design has these advantages:

- Maximum holding strength; not dependent on point contact.
- Adaptability to conditions encountered; it does not have to be inserted to full depth of hole, can take advantage of strata at any chosen depth, provided overall length is approximately correct.
- Maximum head room and haulage way clearance; only bolt head and plate project below roof.
- If holes are not perfectly straight, the Hubbard Bolt will enter where many others will not; no installing tool clearance is required.
- The Hubbard Roof Bolt is the simplest in design, is easily and quickly installed without special tools.



HUBBARD ROOF BOLT COMPANY

25th Street and Guyan Ave., Huntington, W. Va.

"Hang the Load on Hubbard Hardware!"

YOU'VE **read** ABOUT IT...

YOU'VE **heard** ABOUT IT...

NOW YOU CAN **see** IT...

Hendrick Coal Production Equipment at Booth 1408 American Mining Congress Coal Show — CLEVELAND

With skyrocketing costs taking more and more out of each profit dollar, it's becoming increasingly important to find equipment that affords longer service life over heavier work cycles. That's where Hendrick can help out! For over 75 years Hendrick has manufactured rugged, high quality equipment the coal industry wants and needs. While you're at the 1953 Coal Show drop in and inspect Hendrick's cost-cutting coal production equipment — or if you don't plan to attend, write for complete information.

see **Hendrick Flanged-Lip Screens** — for screening and dewatering coal — available with short, medium, or long slots in 148 standard slot sizes.

see **Hendrick Wedge-Slot Screens** — ideal as chute bottoms for screening and dewatering heavy media, for drum and wheel sections, for jig bottoms, on shakers, vibrators and many others.

see **Hendrick Perforated Plate** — tops for vibrating and shaking screens because they maintain uniformity of mesh — available in any desired shape and size of perforation.

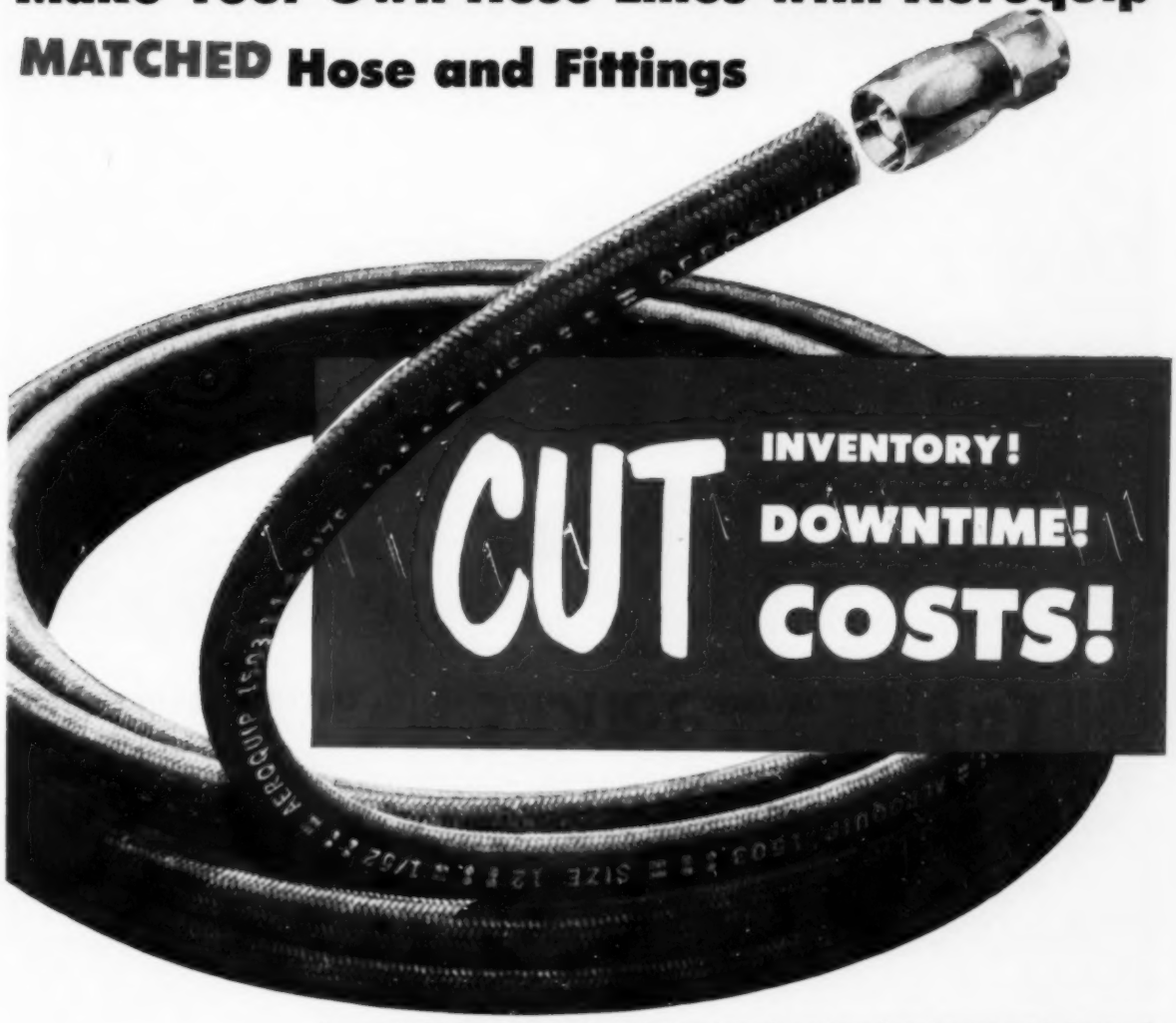
see **Hendrick Elevator Buckets** — tailor made to your specifications in any desired size, shape and capacity, plain or perforated, welded or riveted to handle wet or dry material.

Hendrick
MANUFACTURING COMPANY
41 DUNDAFF STREET, CARBONDALE, PA.
Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

Make Your Own Hose Lines with Aeroquip

MATCHED Hose and Fittings



Aeroquip Fittings are designed, developed, and produced to go with Aeroquip Hose. They form such a foolproof combination that Aeroquip *guarantees* performance. Thus, the hose lines made right in your own plant always measure up to Aeroquip's exacting standards of quality, the highest in the industry. A small supply of Aeroquip Bulk Hose and Fittings assures you of quick hose line replacements at all times . . . and Aeroquip Fittings are detachable and may be used again and again when making new hose assemblies.

Aeroquip

REG. TRADE MARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

SALES OFFICES: BURBANK, CALIF. • DAYTON, OHIO • HAGERSTOWN, MD. • HIGH POINT, N. C. • MIAMI SPRINGS, FLA. MINNEAPOLIS, MINN. • PORTLAND, ORE. • WICHITA, KAN. • TORONTO, CANADA

AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

CHEVROLET ADVANCE-DESIGN TRUCKS

Famous for Their Saving Ways

—and here are 4 Powerful Reasons why!

EXTRA POWER! How can extra power save you money? The high-compression power (7.1 to 1 ratio) of Chevrolet's Loadmaster engines in heavy-duty trucks means extra power and extra miles from each gallon of gas. Chevrolet's Thriftmaster engine in light- and medium-duty models has long been known for economy of operation.

EXTRA STAMINA! Heavier, stronger construction throughout, more rigid frames! Now, Chevrolet trucks are sturdier and tougher than they have ever been in the past—better able to handle the roughest jobs day after day, months on end. Such outstanding stamina is one more factor—and an important one—in reducing your hauling costs.

MATCHED TO THE JOB, TOO! Every Chevrolet truck is carefully engineered and *factory-matched* to the job it will do. You don't buy too big a truck. You don't buy too small a truck. You get a truck with every unit matched and balanced to the work it will do—and that saves you money, too.

EXTRA OVER-ALL ECONOMY! Many things contribute to lower hauling costs with Chevrolet. But, few are as welcome news to buyers as the fact that Chevrolet trucks list for less than any other truck of comparable size and capacity. See your Chevrolet dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTI-PANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET

first in demand in value in sales

Longer Service Life Pays Off

Long service life means plenty to a G.I. . . . and it pays off in the coal fields too. Especially when you're talking wire rope.

That's why mining men look to J&L for wire rope that fits their equipment requirements . . . has the strength, flexibility and toughness to stay on the job and help hold down operating costs. The results of J&L Wire Rope service life are reflected on the profit sheet in terms of minimum downtime for re-rigging, high production and an increase in tons mined per wire rope dollar.

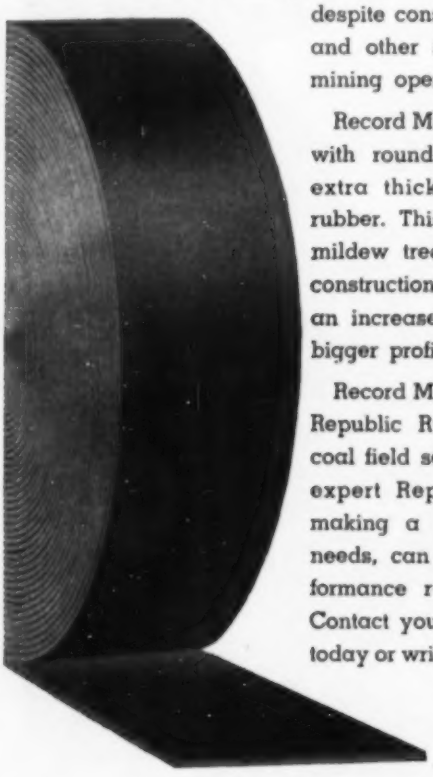
J&L Wire Ropes are quality controlled from the iron ore to the final stranding and closing operations. They are the combination of 100 years of steel-making experience, top-flight wire rope engineering and the most modern production equipment. The result—every wire, every strand, every J&L rope is "precisionbilt" for maximum service.

There's a J&L Wire Rope designed to give *you* cost-cutting service life on *your* equipment. Just ask your J&L representative to check your operation now.

JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH

Use
RECORD MAKER Conveyor Belting

● Speed up operations above and below ground with Republic Rubber's tough Record Maker Conveyor Belting . . . **a belt specially made for handling coal** . . . a resilient rubber-covered belt that resists abrasion, wards off cutting blows and keeps steadily on the move despite constant flexing, buffeting, impact and other service stresses incidental to mining operations.



Record Maker Conveyor Belting is made with rounded edges, reinforced by an extra thick cushion of wear-resistant rubber. This feature, plus the special anti-mildew treated fabrics used in the ply construction, gives Record Maker Belting an increased work capacity that means bigger profits with less effort.

Record Maker Conveyor Belting, like all Republic Rubber Products designed for coal field service, is sold locally through expert Republic Distributors who, by making a free analysis of your exact needs, can help you toward better performance records and lowered costs. Contact your Republic Rubber Distributor today or write direct for further information.

REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

Preparation Facilities

Rochester & Pittsburgh Coal Co., Ernest mine, Ernest, Pa.—Contract closed with Fairmont Machinery Co. for coal-cleaning addition to present plant, using a 10-sq ft-top Chance cone to clean 120 tph of ½x3/16 coal.

Pocahontas Fuel Co., Inc., Bishop No. 33-34 mine, Bishop, Va. — Contract closed with Fairmont Machinery Co. for coal-cleaning plant addition to present facilities, with R-O-M capacity of 600 tph; Chance cones to wash 8x1½ and 3½x¼, with the 8x3½ refuse from the low-gravity cone being crushed and recirculated to the 3½x¼ high-gravity cone; Deister SuperDuty tables to wash ¼x0, with clean coal from tables dried centrifugally and thermally; sizes to be loaded are plus 8-in lump, 8x3½, 3½x1¾, 1¾x¾, ¾x⅜ and ⅜x0.

Lockhard Coal Sales, Shamokin, Pa.—Contract closed with Wilmot Engineering Co. for Type A Wilmot Simplex jig, preparing stove and nut coal at feed capacity of 15 tph.

Cain Coal Sales, Shamokin, Pa.—Contract closed with Wilmot Engineering Co. for Type A Wilmot Simplex jig, preparing stove and nut coal at feed capacity of 15 tph.

Gilberton Coal Co., Gilberton, Pa.—Contract closed with Wilmot Engineering Co. for one Wilmot-Daniels froth-flotation concentrating plant, including one 10-ft-deep by 10-ft-diameter conditioner, and one 6-cell No. 48 Agitair froth-flotation machine preparing 28- to 150-mesh anthracite at feed capacity of 24 tph.

Centralia Mining Co., Centralia, Pa.—Contract closed with Wilmot Engineering Co., for one Wilmot-Daniels froth-flotation concentrating plant, including one 8-ft-deep by 8-ft-diameter conditioner and one 6-cell No. 48 Agitair froth-flotation machine preparing 28- to 150-mesh anthracite at feed capacity of 24 tph.

Armco Steel Corp., Nellis, W. Va.—Contract closed with Jeffrey Mfg. Co. for coal washery with Jeffrey Baum jig; capacity, 200 tph of 6x0.

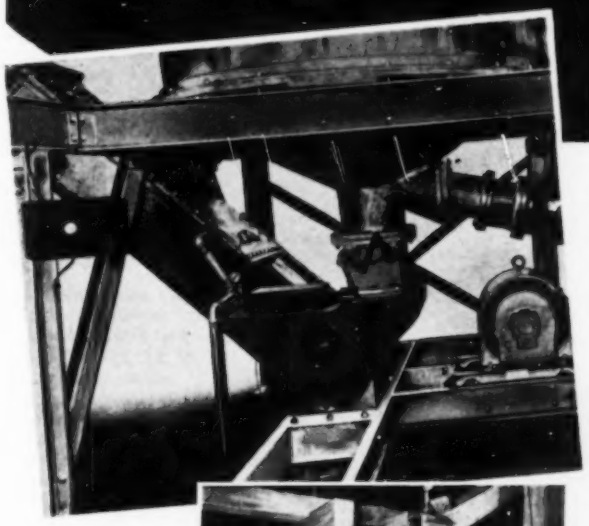
Bridgeview Coal Co., Fayette County, Pa.—Contract closed with Jeffrey Mfg. Co. for a No. 200 unit washery; capacity, 160 tph of 5x0.

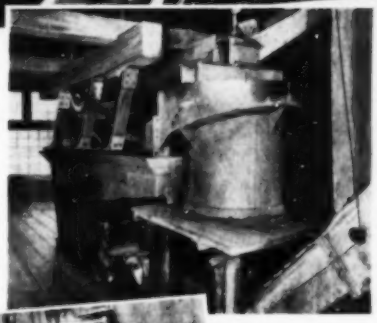
Valley Camp Coal Co. No. 8 mine, Shrewsbury, W. Va.—Contract closed with Jeffrey Mfg. Co., (by Kanawha Mfg. Co.) for a 2-compartment 5-cell Baum jig; capacity, 300 tph of 8x0.

Mahan-Ellison Coal Corp., Lancing, Tenn.—Contract closed with Jeffrey Mfg. Co. (by Rochester & Pittsburgh Coal Co.) for dewatering and sizing equipment; capacity, 130 tph of 3x⅛.

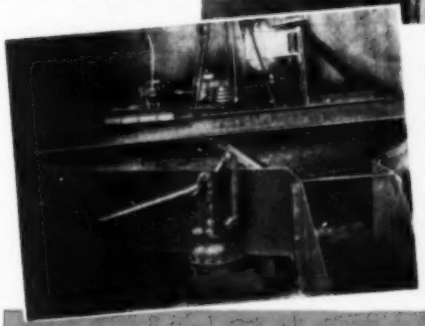
Alabama By-Products Corp., Maxine mine, Maxine, Jefferson County, Ala.—Contract closed with Haworth Engineer-

ARE YOU THROWING OUT VALUABLE FINES?





Above, close-up partial view of Wilmot's patented automatic controls on a Wilmot Hydrotator; signal-control panel at left. A near approach to "push button" preparation.



Wilmot equipment for fine coal recovery: Hydrotators (above), Hydrotator-Classifiers, Froth-Flotation units (left)

You Can Automatically *Recover...*

All Coal to +0 Mesh with Wilmot Hydrotator Cleaners

Obviously, it's like putting "gold in them thar hills" to convey material to the refuse piles before all the marketable fines have been recovered. Because of the remarkable increase in the ratio between yield and labor costs which has been effected by the automatic controls of Wilmot Hydrotator coal cleaners, many operators are now finding it practical to recover fines even down to +0 mesh. These patented controls have also shown impressive records of consistent increases both in ash content of refuse and in accuracy of quality control. When requesting details please mention the sizes to be recovered.

Send for BULLETIN H-511 on Coal Cleaning

WILMOT ENGINEERING CO.

HAZLETON, PA.
Plant: WHITE HAVEN, PA.

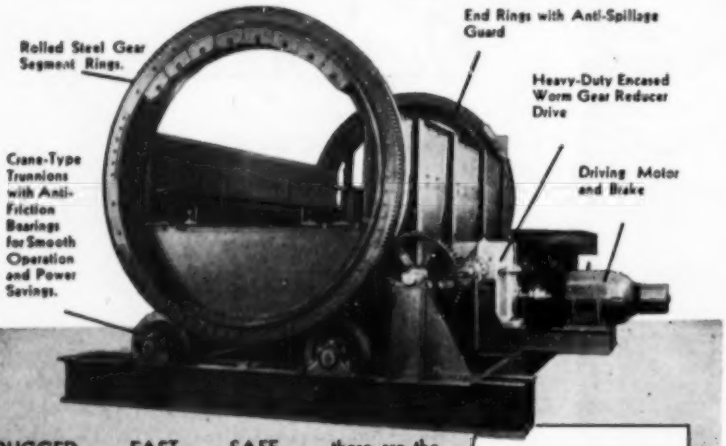
Here's the answer—

TO LOW-COST OPERATION

CONNELLSVILLE (LEPLEY) ROTARY MINE CAR DUMPS

RUGGED FAST SAFE

WITH THESE BUILT-IN FEATURES . . .


Rolled Steel Gear Segment Rings.
End Rings with Anti-Spillage Guard
Heavy-Duty Encased Worm Gear Reducer Drive
Crane-Type Trunnions with Anti-Friction Bearings for Smooth Operation and Power Savings.
Driving Motor and Brake

RUGGED . . . FAST . . . SAFE . . . these are the qualities built into CONNELLSVILLE (Lepley) Rotary Mine Car Dumps that have enabled them to give the most economical service over long periods of time. CONNELLSVILLE (Lepley) Dumps installed in 1927 and 1929 are still in operation and meeting the demands of modern mechanized coal handling.

CONNELLSVILLE (Lepley) Rotary Mine Car Dumps are designed with simplicity and certainty of operation prevailing, with the object of keeping maintenance and repair costs at a minimum. By either lever or pushbutton, one man controls the entire dumping operation . . . Cars are automatically power-locked in position and held secure while discharging . . . Coupled or uncoupled cars are dumped in a 10 second operation . . . Positive gear drive on each end prevents twisting of car in frame.

The proved quality of CONNELLSVILLE (Lepley) Rotary Mine Car Dumps is your assurance of long-term, low-cost operation.

EXCLUSIVE!

EXCLUSIVE with CONNELLSVILLE (Lepley) Rotary Mine Car Dumps are the machine - cut gear rings that mesh with the machine-cut pinions resulting in drive from both ends without play and slippage.

We also manufacture CAGES, HOISTS, HAULAGES, MINE FANS, SKIPS, COAL AND SLATE LARRIES, ROTARY ROCK DUMP CARS, LEPLEY HOISTING EQUIPMENT, YOUGH PUMPS, FORT PITT CAR-CAGING EQUIPMENT.

CONNELLSVILLE MANUFACTURING & MINE SUPPLY CO.

CONNELLSVILLE, PA.

SERVING THE MINING INDUSTRY SINCE 1901

ing & Mfg. Co. for new preparation plant for shipment of coal by barge or rail consisting of conveying equipment to plant, raw coal storage silos, heavy-density plant treating 3x¼ coal, concentrating tables treating ¼x0 coal and conveyors to storage or to barge and railroad cars; capacity, 550 tph.

NEW MINES . . . From p 192

bor, which will have a mooring capacity of 24 barges, a new 26-ft ice-breaker cell and several barge-mooring posts will be built.

The Dubree No. 6 mine, Winona, W. Va., operated by the Maryland-New River Coal Co. until its closing late last fall, was slated to be re-opened last month by the Winona Coal Co. The property is to employ 101 men, according to Leonard Phillips, Winona general manager.

Ending more than a half-century of almost continuous operation, the Graceton No. 3 mine of the Coal Mining Co. of Graceton (Pa.) closed recently. According to the company, which has operated the mine since 1936, the solid coal has been exhausted, and it would transfer some of the men to its Sal No. 1 mine at Luciusboro. Opened in 1897, the mine had produced some 10 million tons of coal, mostly for coke making.

Glen Alden Coal Co.'s management is currently studying the recommendations of a mining-engineering firm to determine whether any of its 14 collieries should be closed to reduce operating costs, it was revealed in the company's annual report to stockholders. The special engineering report made for the company appraised the various collieries, in an attempt to determine whether operations should be concentrated in a fewer number where there would be a better opportunity to control mining costs. The company's annual report showed a net income of $292,000 for 1952, but consolidation of the operating loss of Burns Bros., a sales subsidiary, turned that into a net loss of $316,000. Later, in mid-April, newspaper reports not confirmed by the companies indicated that the Moffat Coal Co. was negotiating to purchase Glen Alden's coal lands in Lackawanna County in a deal that might involve some $8,000,000 and call for formation of a new company. Since 1926, Moffat Coal has been operating under lease various former Glen Alden mines in Lackawanna County.

Colorado Lowers Royalties As Lure to Synthetic Fuels

The Colorado legislature has approved and Gov. Thornton is expected to sign legislation lowering the state's coal royalty fee as a lure for industries that would process the state's coal reserves into synthetic fuels. The measure authorizes the State Land Board to reduce the customary 15c-per-ton royalty for any concern that uses more than 250,000 tons annually from state lands. The measure also places a 5c-per-ton floor under the royalty.

LIMA type 2400

Lima Type 2400, equipped with 120 ft. boom, and 6 cu. yd. bucket.

SHOVEL CRANE DRAGLINE

FOR OPEN PIT MINING, QUARRIES and HEAVY CONSTRUCTION

The LIMA Type 2400 is a big, full mechanical clutch type shovel, dragline and crane with a combination of power, speed and stamina that gives complete satisfaction in all classes of work. It has been given the acid test for high output in rock and fast profitable operation in coal or metal mining. You will recognize at a glance, its heavy-duty engineering which means fewer delays on the job. You will like the smooth, efficient power that flows from its big husky diesel engine; the friction free drums and shafts that rotate on anti-friction bearings and the ease of control through air actuated clutches. These advantages and many more all add up to performance that pays off with fewer delays and bigger profits. You will like the Type 2400—6 yd. Shovel, 110 Ton Crane.

Baldwin-Lima-Hamilton Corporation
Construction Equipment Division
Lima, Ohio, U.S.A.

CAPACITIES: Shovels ¾ to 6 cu. yds. Cranes to 110 tons. Draglines, variable

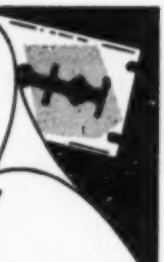
BALDWIN BLH LIMA-HAMILTON

OFFICES IN PRINCIPAL CITIES OF THE WORLD

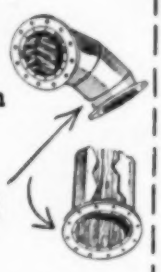
BALDWIN-LIMA-HAMILTON

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES

SAVE THIS AD!



if you buy mine pipe . . . you'll want this valuable information on **MPC Wood-Lined Steel Pipe**



APPLICATIONS: ideally suited for acid mine waters, culm, sludge and slurries.

PRESSURE RATING: up to 400 p.s.i., higher pressure ratings available on special order.

WOOD LINING: clear redwood, Douglas fir, pine or maple staves in thicknesses from 11/16" to 3".

STEEL SHELL: of carbon steel, available from 14 gauge through schedule 80 thickness.

FLANGES: welded to the pipe, carry ratings of 125 pounds upwards, with ASME bolt circle or special drilling.

LENGTHS: 10' and 20' stock lengths or fabricated to order.

INTERNAL DIAMETERS: 4" through 48".

PROTECTION: pipe exteriors can be protected to your specification.

FITTINGS: available for all diameters in standard and special designs.

For complete information write Dept. CA

EST. MPC 1869

MICHIGAN PIPE COMPANY

Bay City • Michigan

Manufacturers of Wood-Stave, Saran Rubber-Lined, Stainless Steel and Monel Piping. Represented nationally by Saran Lined Pipe Co. Detroit, (Ferndale) Michigan.

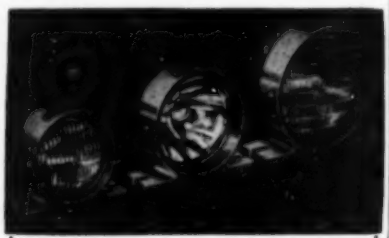
Among the Manufacturers

R. G. LeTourneau, Inc., Peoria, Ill., has appointed John W. Schoen vice president and general sales manager, succeeding R. E. McCluskey, who recently resigned. A graduate of Iowa University, Mr. Schoen held various sales positions with the E. R. Squibb Pharmaceutical Co. and also was associated with the Firestone Tire & Rubber Co. In 1943 he joined the LaPlante Choate Co., and rose to vice president in charge of sales, a position he held for the past 4 yr, until that company was acquired by Allis-Chalmers early this year.

The Fairmont Machinery Co., Fairmont, W. Va., has appointed Richard C. Love vice president.

Goodyear Tire & Rubber Co., Akron, Ohio, has named Charles T. White Jr., formerly belting sales engineer, Pittsburgh district manager, Industrial Products Div. Joining Goodyear as a factory-office trainee in 1947, he entered the Industrial Products Div. as a clerk at Charlotte, N. C., in 1948, was promoted to industrial products field representative at Greensboro, N. C., in 1949, and was made a senior staffman in industrial products sales at Akron, in 1951.

Harnischfeger Corp. has named W. E. Hawkinson Jr., sales manager of the P&H Large Excavator Div. District representative in southeast Asia and the Pacific area for the past 2 yr, Mr. Hawkinson joined the company as a sales trainee in 1941, later entering the export repair-sales department.



GUYAN *Sealed Beam*
HEADLIGHTS for MINE EQUIPMENT

GUYAN Sealed Beam Headlights are made in three sizes to meet various mining conditions. The voltage rating is 6 volts for all three types. To operate from 250 or 500 volt trolley voltage we can furnish either a resistor or a power unit.
Type 4 IN is recommended for gathering locomotives, shuttle cars and loading machines.
Type ML for main line locomotives has a narrow, powerful beam (70,000 beam C.P.)
Type 7 IN is a utility headlight using standard automobile lamp, two filaments, to project the beam either close or far.

Write for Bulletin

GUYAN MACHINERY CO.
LOGAN . . . . West Virginia

Firth Sterling, Inc., Pittburgh, has named T. G. Barnes general sales manager. Mr. Barnes came to Firth Sterling as special assistant to the chairman in April, 1950, from Reynolds Metals Co. and a year later became production manager. G. A. Wilson, formerly general superintendent of the Carbide Div., succeeds Mr. Barnes as production manager.

Joy Mfg. Co., Pittsburgh, last month acquired Barnes & Reinecke, Inc., a 19-yr-old Chicago engineering company specializing in mechanical research and development. The firm will operate with its present name and personnel as a Joy subsidiary, continuing to serve the engineering-development needs of industry in general as well as to accommodate Joy's additional needs in product development, it was announced. Pointing out that the move reflects Joy's added emphasis on research and development, J. D. A. Morrow, Joy president, said: "With engineering development of increasing importance to our company, this acquisition will speed up our progress. Here is an experienced, successful organization ready to serve us, as well as others. The ready-made skills of the Barnes & Reinecke organization will have special value to us in our plans for diversification into new product fields."

Kennametal, Inc., Latrobe, Pa., has appointed Dario S. Parisi, in coal mining for 35 yr and formerly mine superintendent and mine foreman in various operations around Kittanning, Pa., a representative in the central Pennsylvania area. Mr. Parisi replaces James J. McNally, veteran Kennametal representative transferred to central West Virginia.

Edward T. Day has been named manager of branch sales for mechanical goods division, United States Rubber Co., New York. Appointed at the same time was Matthew J. Delehaunty, who becomes manager of industrial sales. Mr. Day, affiliated with the sales department of the division since he joined U. S. Rubber in 1934, has been in the New York office for the past year and previously was with the Salt Lake, Chicago, and Los Angeles offices. Mr. Delehaunty, former sales manager for the Pittsburgh branch of mechanical goods, has been with the company since 1922. His successor in Pittsburgh is H. A. Lundberg, now a salesman at that branch.

The Pittsburgh branch of the Hercules Powder Co. has moved into new quarters in the Gateway Center, 140 Stanwix St., Pittsburgh 22.

Henry O. Erb, coal-preparation consultant, Box 867, Terre Haute, Ind., has

(*Continued on p 252.*)

Visit the Tycol exhibit
Booth 909, Public Auditorium
Coal Show, Cleveland, Ohio
May 11 - 14

...with TYCOL lubricants on hand!

Coal preparation plants are solving a basic lubrication problem!

In one instance, 20,000 tons per day are processed for coking. Yet, *one* gear lubricant – Tycol Apreslube – serves throughout! Rather than chance a costly error by stocking and using eight to ten different lube oils, this operator found Apreslube ideal for literally hundreds of gears – worm, spur, and herringbone – in all sizes. Result? Simplification . . . and longer gear service! Apreslube's EP properties reduce wear to a minimum . . . other features combat moisture introduced through "breathing action".

More details? Contact your nearest Tide Water Associated office!

Over 300 Tycol industrial lubricants are at your disposal . . . engineered to fit the job!

REFINERS AND MARKETERS OF VEEDOL . . . THE WORLD'S MOST FAMOUS MOTOR OIL

TYCOL
INDUSTRIAL LUBRICANTS

Boston • Charlotte, N. C. • Pittsburgh
Philadelphia • Chicago • Detroit
Tulsa • Cleveland • San Francisco
Toronto, Canada

TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE · NEW YORK 4, N. Y.

PUMP'S FINE TODAY... BUT HOW ABOUT TOMORROW?

With Rex and only Rex

You're assured new pump efficiency for the lifetime of the pump because . . .

ONLY REX HAS THE ADJUSTABLE AIR PEELER!

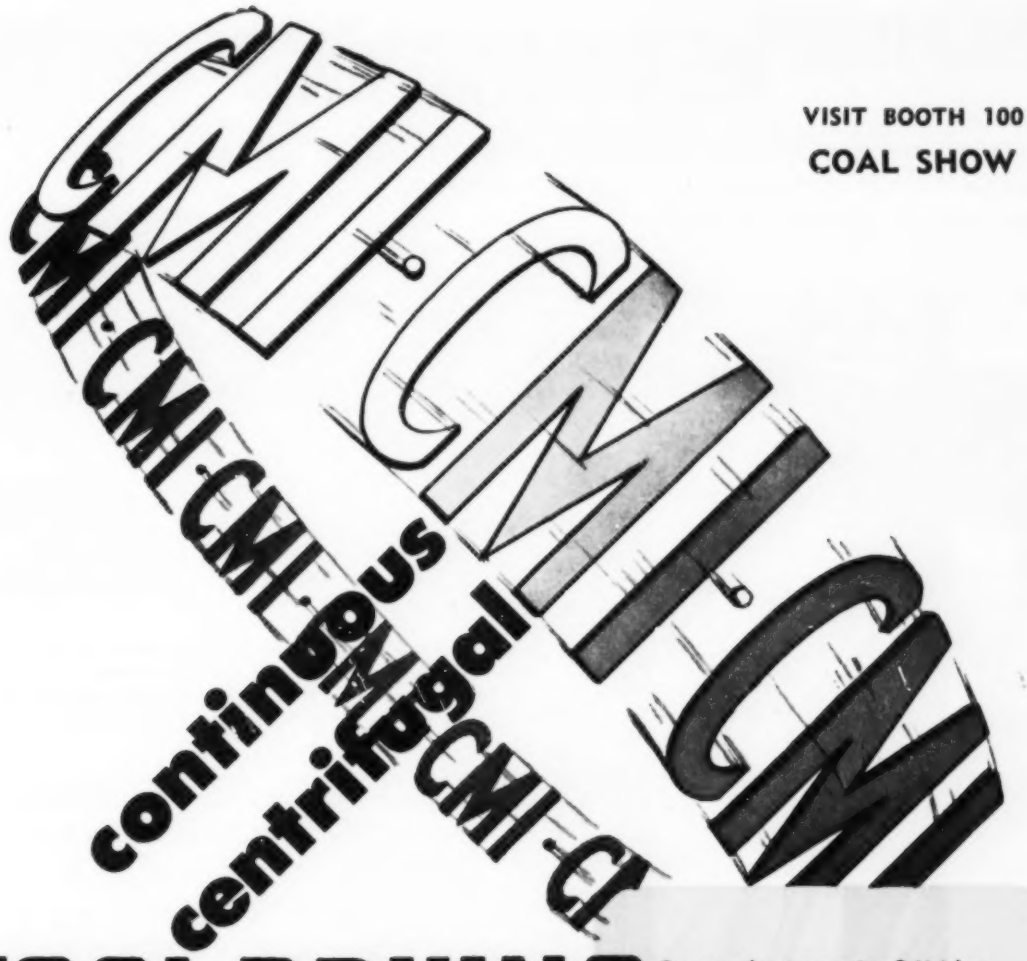
Every self-priming, centrifugal pump must have an air peeler to remove air from the suction line and create the vacuum that draws water up to the impeller. Normal wear on the peeler and fast-moving impeller destroys the necessary close clearances between these parts . . . reducing both priming and pumping efficiency.

Here's where *Rex alone* can maintain original priming and pumping efficiency for life. A simple adjustment of the *exclusive Patented Adjustable Air Peeler* and you've restored its original close clearance with the impeller. Just a twist of the wrist and you've restored new pump efficiency . . . for today . . . and tomorrow.

Get all the details on this and other exclusive Rex features from your local Rex distributor or write to Chain Belt Company, 4786 W. Greenfield Ave., Milwaukee 1, Wis.

CHAIN BELT REX COMPANY

CONSTRUCTION MACHINERY



VISIT BOOTH 100
COAL SHOW

COAL DRYING

Over and over again, C-M-I has proved itself to be the last word in centrifugal know-how, engineering and workmanship. Since acquiring all basic patent rights of the original Elmore Dryer over forty years ago, C-M-I has continued to develop the principal of centrifugal drying, producing units that are reaching previously undreamed of peaks of performance and efficiency.

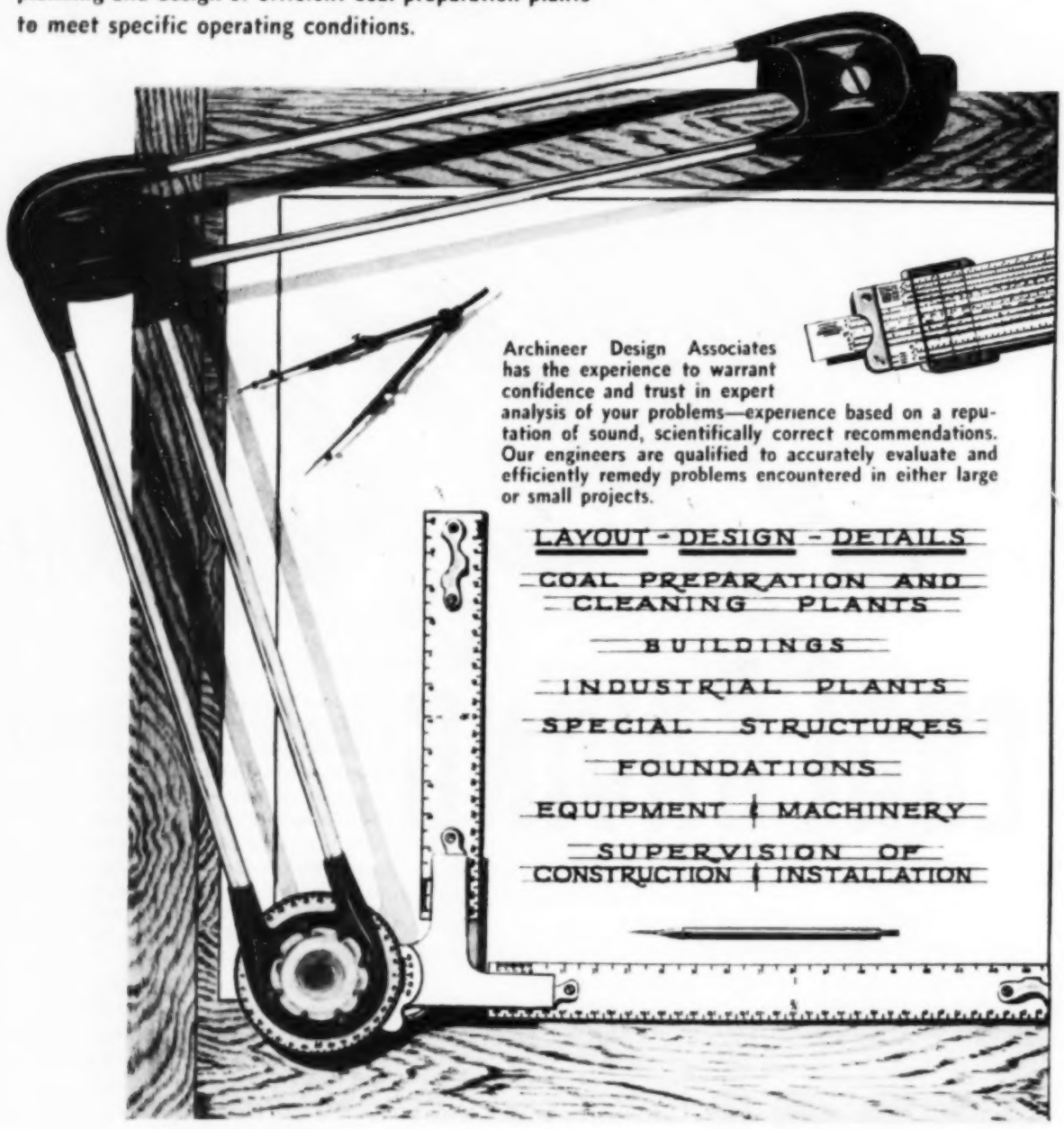
To further serve the Coal Industry, we maintain a complete laboratory to aid in solving individual dewatering problems. We will be very happy to aid you. **Write, wire or telephone Prospect 2848.**

C·M·I CENTRIFUGAL DRYER

CENTRIFUGAL & MECHANICAL INDUSTRIES, INC.
146 PRESIDENT STREET ST. LOUIS 18, MO.

ARCHINEER—a name you can depend upon for all your Engineering Needs

Cooperating with operators and management in the planning and design of efficient coal preparation plants to meet specific operating conditions.



Archineer Design Associates has the experience to warrant confidence and trust in expert analysis of your problems—experience based on a reputation of sound, scientifically correct recommendations. Our engineers are qualified to accurately evaluate and efficiently remedy problems encountered in either large or small projects.

LAYOUT - DESIGN - DETAILS

COAL PREPARATION AND CLEANING PLANTS

BUILDINGS

INDUSTRIAL PLANTS

SPECIAL STRUCTURES

FOUNDATIONS

EQUIPMENT & MACHINERY

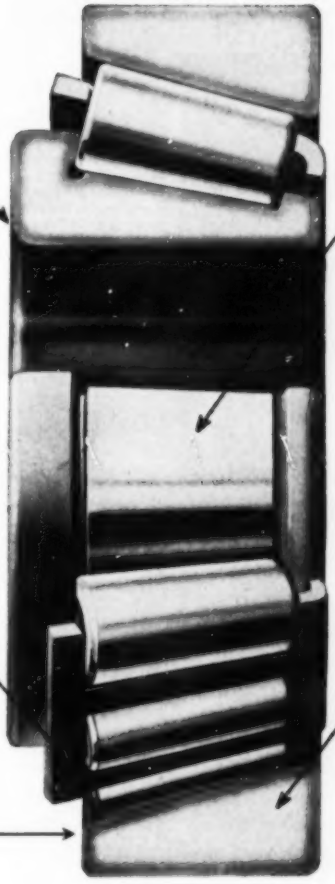
SUPERVISION OF CONSTRUCTION & INSTALLATION

Archineer Design Associates

Registered Engineers

Fairmont, West Virginia

Why 95% of Coal Show mining equipment exhibitors use TIMKEN® bearings



1 **GENEROUS RADIUS**—for greater shaft strength.

2 **CHOICE OF 26 DIFFERENT TYPES.**

3 **SOFT STEEL CAGE**—to keep rollers separate and prevent scuffing.

4 **PRECISION MANUFACTURE**—which makes possible bearings with a maximum runout tolerance of less than 75 millionths of an inch.

5 **CASE-HARDENED BEARING SURFACES**—to resist wear.

6 **MICRO-INCH SURFACE FINISH**—to minimize friction.

7 **CHOICE OF 5850 SIZES.**

8 **TIMKEN FINE ALLOY STEEL**—specially developed to give long bearing life.

9 **TOUGH CORE**—to resist shock.

10 **POSITIVE ROLLER ALIGNMENT**—gives maximum bearing capacity.

NO other bearing gives you *all* the advantages you get with Timken® bearings. That's why 95% of the mining equipment exhibitors in this year's Coal Show use Timken bearings.

The Timken Company is the foremost producer of tapered roller bearings and leads in 1) advanced design, 2) precision manufacture, 3) rigid quality control, and 4) special analysis steels.

Be sure that every bearing you use in the coal mining machinery you buy or build is stamped with the trademark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

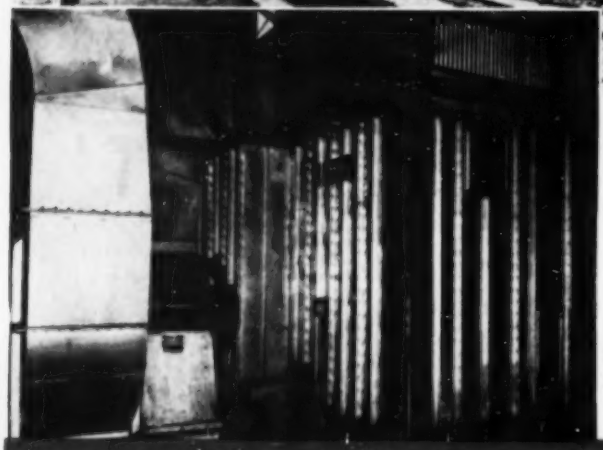
GOING TO THE COAL SHOW?

We'll be at the Coal Show in Cleveland, May 11-14 in Booths 900 and 905 ready to show you the advantages of using Timken tapered roller bearings in your mining equipment.

TIMKEN
TRADE-MARK REG. U.S. PAT. OFF.
TAPERED ROLLER BEARINGS

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION ✳

At the Itmann Plant of Pocahontas Fuel Co., Pocahontas, Va., dust is captured at the air plant (left) in Pangborn Dust Collectors.



Close-up of Pangborn Dust Collector operating within plant.

For more profitable coal preparation

Look to

PANGBORN DUST CONTROL

More mechanization and more production have helped the coal industry meet industry's vastly increased demands over the past decade. But they have created a serious problem for coal processing plants. If *you* face this problem—it will pay you to look to Pangborn Dust Control for the answer!

Pangborn Dust Control traps dust at the source—at tipples, dry cleaning, de-dusting and other operations. And Pangborn Dust Control saves you money, pays for itself by . . . (1) improving the reclamation of valuable dust . . . (2) lowering plant maintenance costs . . . (3) increasing the life of your machines because they operate in a cleaner atmosphere. What's more, higher morale and better health of employees mean increased production.

If you're losing profits because of excessive dust, let Pangborn engineers conduct a free Dust Pocket Survey. It costs you nothing but can mean big savings. Write today for details and your free copy of Bulletin 909A. Just address: PANGBORN CORPORATION, 2800 Pangborn Blvd., Hagerstown, Maryland.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

Pangborn DUST CONTROL

STOPS THE DUST HOG from stealing profits

been appointed manager of sales and engineering for the Water Neutralizing Co., Columbia, Mo., in charge of the marketing of its patented process for neutralizing acid waters used for washer-plant make-up water or contained in washer discharge.

Trumbull Electric Dept., General Electric Co., Plainville, Conn., has made three changes in the field sales organization. J. E. Kerby, for the past 2 yr manager of the department's southwest district, has been named manager of the newly created west central district, with headquarters in Kansas City, covering the states of Kansas and Colorado, and parts of Oklahoma, Arkansas, Wyoming, New Mexico and Missouri. A. P. McGraw, sales representative in the South Carolina area, has been named manager of the southwest district, with offices in Houston, covering Texas and parts of New Mexico, Oklahoma, Mississippi, Alabama, Arkansas, Louisiana and Florida. J. E. Van Effen has been named manager of the newly established Cleveland district, with headquarters in Columbus, including parts of Ohio, Pennsylvania and West Virginia.

Galion Allsteel Body Co., Galion, Ohio, has named R. H. Tomlinson regional representative, directing sales and service in Kentucky, Alabama, Mississippi, Louisiana and Arkansas, with offices in W. Memphis, Ark. Prior to joining Galion, Mr. Tomlinson was district manager of the GarWood Industries.

Hoyt Wire Cloth Co., in its new Lancaster (Pa.) plant, now is providing a complete line of aggregate wire screens and industrial wire cloth. The new company purchased the machinery from John A. Roebling's Sons Co., Trenton, N. J. and installed it in a new 27,000-sq ft building in Lancaster. F. G. Hoyt is president of the company and Wm. Hobbs Jr., vice president—sales manager. Both were with John A. Roebling's Sons Co., each having had over 18 yr experience in the wire and wire-cloth industry.

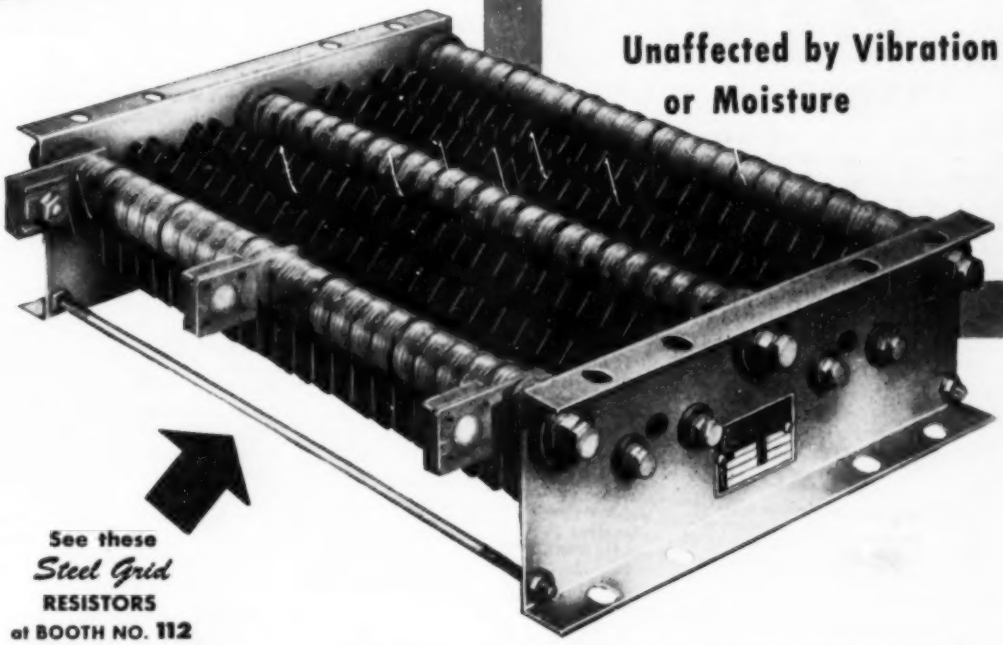
Allis-Chalmers Mfg. Co. has combined the district and branch office territories of Denver, Salt Lake City, Phoenix, El Paso and Spokane into the Rocky Mountain Region with headquarters at Denver. Richard D. Moody, manager of the Los Angeles district office since 1950, has been appointed manager of the new region. A graduate of the Colorado School of Mines, Mr. Moody joined Allis-Chalmers graduate-training course in 1938, and was connected with the company's Knoxville and Chattanooga offices before entering military service. He was named manager, San Francisco office, in 1947. Richard L. Engle, a representative in that office, succeeds Mr. Moody.

General Electric Co., Bridgeport, Conn., has announced two organization changes in the Construction Materials Div. The Wiring Device Dept., at Bridgeport, and the Monowatt Dept., at Providence, R. I., have been consolidated into a new department known as

(*Continued on p 254.*)

RUGGED
ALL THE WAY Thru

- All Steel Construction
- Mica Insulation
- Rugged Terminals
- Provision for Expansion
- Adequate Ventilation
- Corrosion Resistant
- Unaffected by Vibration or Moisture



See these *Steel Grid* RESISTORS at BOOTH NO. **112** Mining Congress Coal Show

P-G Resistors, assembled from alloy steel resistance grids with mica insulation, are naturally resistant to many of the operating conditions usually associated with resistor trouble. Try P-G Resistors next time on your toughest job, they are rugged . . . they are dependable.

P-G

The Nonbreakable Steel Grid Resistor

THE POST-GLOVER ELECTRIC COMPANY

•ESTABLISHED 1892•

221 WEST THIRD STREET, CINCINNATI 2, OHIO

Don't Throw Away

THE SILVER IN YOUR COAL MINE

SAVE UP TO 25¢ PER TON WITH

OSMOSE

TREATED MINE TIMBERS

The timbers in your mine represent plenty of "silver" when you consider that this one item represents 40% to 60% of your supply bill. If you let timbers ROT, you might just as well throw away a shovelful of your hard earned profits every day in the week. We can cut your maintenance cost by making mine timbers LAST LONGER. You save on timber! You save on replacement! With Osmose you can make ANY wood species, even beech, gum, hickory, ash, elm and maple, into long lasting timbers.

1 **We can furnish you with OSMOSE TREATED TIMBER**

We can supply you with Osmose-treated square-sawed, slabbed or round timbers, ties, collars, posts, lagging, caps, wedges or tipple timbers from one of our treating plants. These select OSMOSE-treated timbers will render many years of EXTRA service.

2 **We will CUSTOM-TREAT TIMBERS furnished by you**

We will OSMOSE-treat your own timber at our nearest treating plant. Remember, this treatment can be applied to ANY wood species, even beech, gum, hickory, ash, elm and maple.

3 **We will furnish MATERIALS and YOU can treat your own timber**

By constructing an inexpensive vat and following directions, you can treat your own green timber with OSMOSALTS.

➡ **WRITE FOR COMPLETE DETAILS ON THE TYPE OF OSMOSE SERVICE YOU PREFER**

OSMOSE WOOD PRESERVING COMPANY OF AMERICA, INC.
980 ELLICOTT STREET • BUFFALO 9, N. Y.
Representatives in Pittsburgh, Denver, Birmingham, Ala., Charleston, W. Va. and Harlan, Ky.

COAL MEN ON THE JOB

POWER COAL CO.: W. V. Hartman (left), superintendent, Montrose, Mo.; and Eric Sarapuu, research engineer, Sinclair Coal Co., Kansas City, Mo.

the G-E Wiring Device Dept., with headquarters in Providence. Abe F. Warren, general manager, Monowatt Dept., has been named general manager, and Arville W. Gilmore, manager of marketing, Construction Materials Div., has been named assistant general manager for the consolidated department. Both General Electric and Monowatt brand lines will be retained and manufacturing operations will be continued at present locations. The second change was the establishment of an Accessory Equipment Dept., consolidating the industrial section of the Monowatt Dept. with the accessory-equipment section of the Wiring Device Dept. Frederick C. Dazley, former manager of marketing for the Wiring Device Dept., has been named general manager for the new department. Joseph J. Lengyel, manager of sales, Construction Materials Div., has been appointed manager of the Marketing Dept., succeeding Mr. Gilmore.

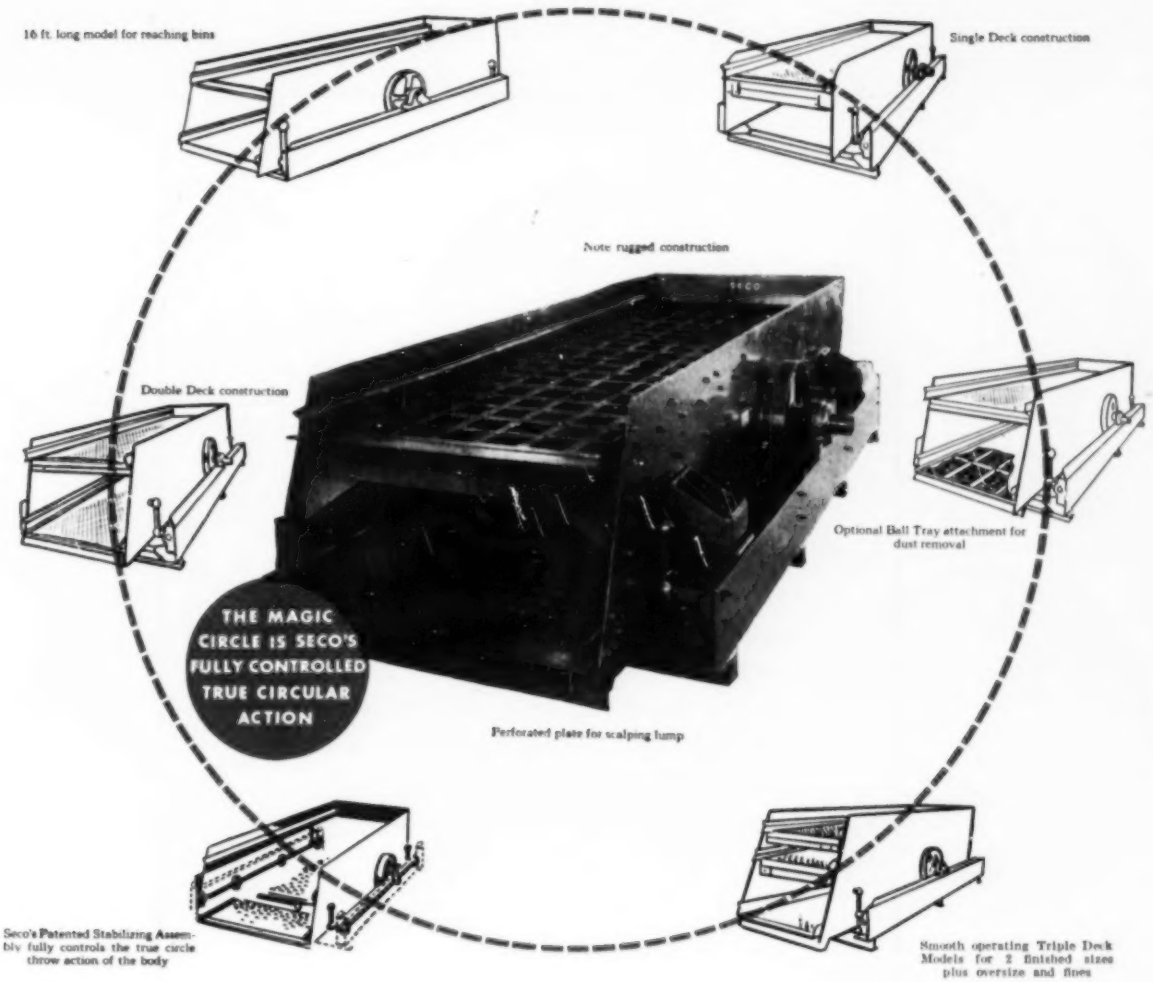
Raybestos-Manhattan, Inc., Passaic, N. J., has moved from 445 Lake Shore Dr. into its newly constructed Chicago office and warehouse building at 6010 Northwest Highway. The new building provides greatly expanded facilities for warehousing and sales offices, as well as national sales headquarters for the equipment-sales division.

Rockbestos Products Corp., New Haven, Conn., has named James F. McClelland Jr. engineering manager with responsibility for the coordination and direction of standards engineering, quality engineering, research and development, and chemical engineering. He recently held the position of standards engineer.

Fruehauf Trailer Co. has named J. C. Scott, for the past 2 yr director of priorities, new-product sales manager. Joining Fruehauf in 1941, Mr. Scott served during World War II as the company's manager of material survey department,

(*Continued on p 259.*)

HERE'S THE "*MAGIC CIRCLE*" FOR CLEAN COAL IN THE WANTED SIZES


16 ft. long model for reaching bins
Single Deck construction
Note rugged construction
Double Deck construction
Optional Ball Tray attachment for dust removal
THE MAGIC CIRCLE IS SECO'S FULLY CONTROLLED TRUE CIRCULAR ACTION
Perforated plate for scalping lump
Seco's Patented Stabilizing Assembly fully controls the true circle throw action of the body
Smooth operating Triple Deck Models for 2 finished sizes plus oversize and fines

Hundreds of Coal Operators Attest to the Accuracy and Dependability of Seco Vibrating Screens

Today, screening R. O. M. into sizes to meet the market's demands, is no longer considered an extra cost of operation, *but* a sound business practice that actually *ups* profits for progressive operators. That's where Seco screening equipment fits into the modern coal preparation picture. The proved smooth operation and long life of dependable Seco vibrating screens are paying off in more profits per ton for hundreds of operators.

Are you in the "magic circle"? If not, why lose dollars waiting . . . Get the facts on Seco low cost per ton cleaning and sizing today! Write for new Coal Bulletin #41.

SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

SCREEN EQUIPMENT CO., INC.
1750 Walden Ave., Buffalo 25, N.Y.
In Canada: United Steel Corp., Toronto, Ont.

?

There's no question about it

The most dramatic new development in the entire mining industry will be on display at Booth #233, at the Coal Show in Cleveland, by the Manu-Mine Research & Development Company of Reading, Pennsylvania.

Don't miss it !

MACHINE MILESTONES... MEASURED IN OIL! **The impressive record of petroleum "firsts" listed above spans 87 years of industry's most spectacular progress. From the first mineral oils for machines in 1866 to the first oils for Diesel engines, cars, planes—right on up to correct lubrication for the world's fastest superliner—Socony-Vacuum has pioneered the development of the products that have helped make these advances possible. Today, this wealth of lubrication knowledge and experience is yours—to help boost your output, cut your maintenance costs. Why accept anything less?**

SOCONY-VACUUM
Correct Lubrication

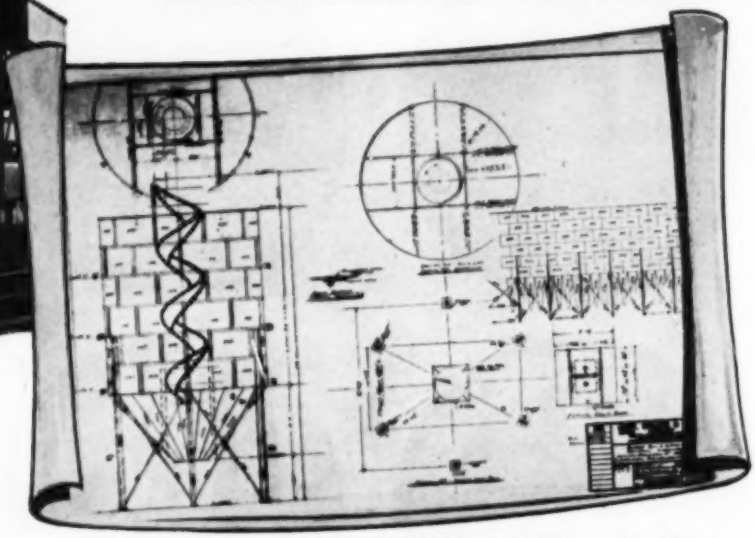
SOCONY-VACUUM

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

HOLMES

COAL HANDLING AND PREPARATION EQUIPMENT

engineered to your individual needs...



THIS INSTALLATION of a Holmes Lowering Spiral and Coal Storage Bin (Steel Type) was made at the Jamison Coal & Coke Co., Mine 21, Hostetter, Pennsylvania.

It was preceded by a careful survey of the requirements and was *individually engineered* to do the job for which it was intended.

LOAD BINS FAST... AVOID BREAKAGE WITH HOLMES LOWERING SPIRALS

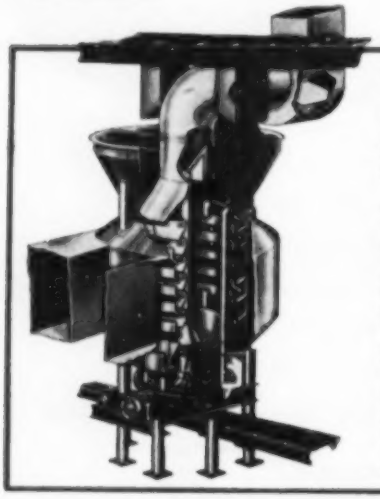
- **No droppage to degrade your coal**
- **No wear and tear on bins**
- **Costs nothing to operate** (gravity operated)

Robert Holmes Lowering Spirals are designed to lower material through the use of centrifugal force, thus eliminating the need of an inside retaining lip. Each spiral is formed like a well-banked race track. The coal automatically slows down when it reaches the "safe" speed limit, regardless of the distance of travel.

As there is no retaining lip, the coal slides gently off onto the peak of the pile to form a natural angle of repose. In this way, the coal is spread out uniformly . . . a real advantage where segregation is a problem.

Lowering spirals are essential to proper handling in surge bins, run-of-mine storage bins and pockets, mine retail sales bins, and consumer storage systems.

For free literature and complete details write Dept. A-26



CONTINUOUS-FLOW ONE-PASS DRYING with *Baughman* VERTI-VANE THERMAL COAL DRYER

Both low in initial cost and operating cost . . . each Verti-Vane unit is designed for capacities from 15 to 75 tons. It handles all coal sizes from 1½" down. Reduces surface moisture to approximately 2% in a "one-pass" operation. Minimum of moving parts and slow-speed operation tend to eliminate shift breakdowns and lost time. Easily adjusted for feed conditions . . . requires little attention.

Write for Free Catalog No. 101 Today. Please address Dept. A-26.

ROBERT HOLMES & BROS., Inc. DANVILLE ILLINOIS

Manufacturers of: SHEAVES, TIPPLE EQUIPMENT, CAGES, SKIPS, LOWERING SPIRALS, CAR PULLERS AND RETARDERS, DRYERS, LABORATORY CRUSHERS, HOISTS, VIBRATING SCREENS, DUSTOLATORS.

and from 1944 to 1951, was a salesman in the Chicago branch.

Koppers Co., Inc., Pittsburgh, has named Harry P. Neher Jr., assistant manager, central staff sales department, succeeding Donald MacArthur, recently made manager of the Washington office. Thomas H. Cable has been named manager, sales-methods section, succeeding Mr. Neher, and George C. Miller, manager, international-product sales section, succeeding Mr. Cable.

United States Steel Corp., Pittsburgh, has appointed Lewis T. Gibbs assistant manager of sales, high-strength-steel division. Mr. Gibbs, assistant to the manager of sales, railroad-materials division since 1946, joined U. S. Steel in 1936. George I. Reynolds Jr. has been made assistant director of market development. Mr. Reynolds, assistant manager, product section, in the company's commercial research division, joined U. S. Steel in 1947 as a market analyst in the commercial research division.

Euclid Road Machinery Co., Cleveland, has appointed Ray-Brooks Machinery Co. distributor for its earthmoving equipment in the southern half of Alabama. The new distributor maintains headquarters at Montgomery and a branch at Mobile, both equipped with ample parts stocks and modern shop facilities. Key personnel are: John H. Brooks, president; C. S. Ray, vice president; John C. Post, sales manager; James E. Hall, parts manager; Ben H. Richardson, service manager; and P. V. Johnson, office manager.

C & D Batteries, Inc. has placed Robert D. Briggs in charge of sales and service in the Cincinnati territory with headquarters at 7446 Vine St., Cincinnati 16, Ohio.

The Colorado Fuel & Iron Corp. has appointed K. B. Stuart general manager of coke and chemical sales. He began his career as a chemist at the CF&I coke plant in Pueblo, Colo., becoming chief chemist in 1929, and in 1934, he was named manager of chemical sales. M. P. Drummond has been appointed manager of coke sales and F. P. Jasper has been named manager of chemical sales.

R. C. Wietersen, director of purchases, Buda Co., Harvey, Ill., has been elected president of the Internal Combustion Engine Institute, whose membership includes the major manufacturers of high-speed gasoline and diesel engines. Other officers elected at the annual meeting were: vice president, J. E. Heuser, sales manager, Engine Div., Le Roi Co., Milwaukee; secretary, R. H. Kerr, chief engineer, Climax Engine & Pump Mfg. Co., Clinton, Iowa; and treasurer, J. D. Cook, secretary and treasurer, Hercules Motor Corp., Canton, Ohio.

The Dumas Steel Corp., Pittsburgh, opened a new warehouse at Marietta, Ga., April 6, located in the McNeal Bldg., Sessions St. Operations at the new

(*Continued on p 262.*)

Man-Alive! this Hydraulic Jack DOES EVERYTHING but walk and talk!

Visit the Blackhawk booth No. 825 at the Cleveland Coal Show. May 11-14

It's a "Porto-Power" . . . not an ordinary jack — and every mine and coal preparation plant needs it. "Porto-Power" promotes safety and creates spectacular savings in time and materials. Remote control, with pump separated from ram by a flexible hose, lets men work fast and comfortably. Standard attachments adapt the all-directional hydraulic ram to make short work of "1001" jobs.

Just a few of the many jobs licked by

Porto-Power

STRAIGHTEN DENTED MINE CAR PANELS — no dangerous blocking. No sledging.

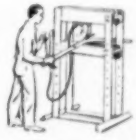
PUSH OVER ANY SPAN — steel attachments couple to ram, eliminate hazardous blocks.

PULL PULLEYS, wheels, gears. No dangerous, damaging hammering and prying.

STRAIGHTEN BUCKETS— apply tons of force exactly where you want it to push out bashes.

BEND PIPE the easy way. Equipment is portable— handles all popular pipe and conduit.

BEND RAIL, straighten bent parts. Insert or remove bushings, pins, shafts.



FREE BLUEPRINTS show how to build a low-cost hydraulic "Porto-Power" press.

CLAMP parts for welding, bolting, etc. "Porto-Power" is also used by rescue crews.

Every maintenance crew needs this S-31 KIT

It's a basic "Porto-Power" assortment and includes a 10-ton hydraulic unit and 23 attachments. You'll find S-31's pay for themselves on a couple of good jobs. Order this terrific work saver from leading supply houses or write Blackhawk today.

BLACKHAWK

FREE! Send coupon for famous Blackhawk IDEA BOOK.

BLACKHAWK MFG. CO., Dept P-4553, Milwaukee 1, Wis.

Please send me immediately a FREE copy of your 64-page, profusely illustrated IDEA BOOK.

Name ..... Title .....

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Address .....

City ..... Zone ..... State .....

there's a difference!

YARDLEY *ClearStream* MINE PIPE

is better 6 ways . . .

BE SURE before you buy. There *is* a difference in plastic pipe. To protect you, Yardley guarantees ClearStream Pipe in two ways — will not rot, rust or electrolytically corrode — full weight and all thickness to Standard Schedule 40 for steel pipe.

"It costs less in the long run" means just that. Comparison with other types will prove Yardley ClearStream Pipe superior for installation, performance and long range economy. Write for Bulletin 100.

HERE'S WHY

MORE WATER Delivers 25% greater volume for the same head loss.

COMPLETE LINE M-1 for standard drainage lines, M-2 for fresh water lines, M-4 Suction and high pressure lines. Complete range of standard and special fittings.

PRODUCTION Manufacture of mine pipe, fittings and adaptors, *in Yardley's plant* assures supplies for any requirement.

LOW COST Fewer fittings, faster lay-up, lighter weight (13 times lighter than steel) make savings up to 60%.

GUARANTEED Will not rot, rust or electrolytically corrode. Acid mine water just can't hurt this pipe . . . and there's no friction-producing scale.

DISTRIBUTION Nationally distributed through reputable dealers.

YARDLEY PLASTICS. COMPANY

142 PARSONS AVE., COLUMBUS 15, OHIO

Du Pont's

Rayflex

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Conveyor Belting

"Cordura"

Another New
in Hamilton's Line of High Quality Conveyor Belting

In addition to Hamilton's regular cotton carcass Conveyor Belting, we now offer RAYFLEX, made of Du Pont's "CORDURA"—a high tenacity rayon—with many advantages.

Rayflex offers these advantages

1. Greater strength
2. Greater flexibility
3. Better troughing
4. Lighter in weight
5. Less stretch

RAYFLEX belting is designed for greater tensile strength with relatively lower longitudinal stretch, thus requiring less take-up than standard cotton carcass conveyor belting. RAYFLEX is mildew-proofed!

For complete details on the many advantages of RAYFLEX Conveyor Belting, write us today.

VISIT OUR EXHIBIT

Booth No. 2564
Coal Convention and Exposition
THE AMERICAN MINING CONGRESS
Cleveland, Ohio
May 11th to 14th

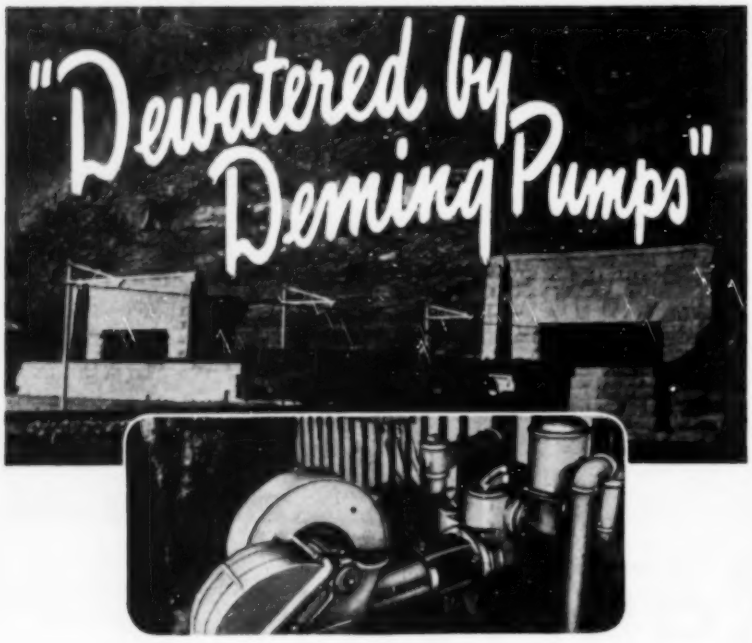
HAMILTON RUBBER MFG. CORP., Trenton, N. J.
MANUFACTURERS OF QUALITY RUBBER PRODUCTS FOR OVER 35 YEARS

COAL MEN ON THE JOB

HUME-SINCLAIR COAL MINING CO., Roy Houck (left), shop foreman, and Ervin Baker, superintendent, Tiger mine, Hume, Mo.; R. R. Craig and Tom Cloud, clerks, Huntsville-Sinclair Mining Co., Huntsville, Mo.

warehouse will consist of processing and marketing steel products, and will serve customers in seven southeastern states, including Alabama, Florida, Georgia, Tennessee, North and South Carolina and Mississippi. J. W. Clouser, formerly head of the Dumas warehouse in Jersey

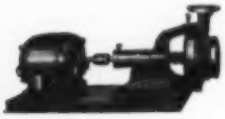
(*Continued on p 267.*)



Years of dependable performance under severe conditions at low operating costs is the record of the Deming Fig. 1896 "Oil-Rite" Double-Acting Mine Pump illustrated above.

Hundreds of mines in the United States and foreign countries depend upon Deming Pumps for mine gathering and dewatering service.

For complete information, write for Bulletin No. 1000-A.



Deming Side Suction Centrifugal Pump

THE DEMING CO.
533 Broadway
Salem, Ohio

Deming Self-Priming Centrifugal Pump

Specify **DEMING**

DEPENDABLE MINE PUMPS

INDUSTRIAL TRACK

Need Rails—Switches—Frogs—Guard Rails—Track Tools? For best selections, prompt deliveries—*try FOSTER*—shipments from stock in 5 nationwide warehouses.

Call on FOSTER for everything in Industrial Track Equipment and supplies.

RAILS New and Relaying

Send for Track Equipment Catalog #C-5

L. B. FOSTER CO

STEEL SHEET PILING • PIPE • WIRE ROPE

PITTSBURGH 30, PA. NEW YORK 7, N.Y.
CHICAGO 4, ILL. HOUSTON 2, TEX.

For All-Round Lubrication

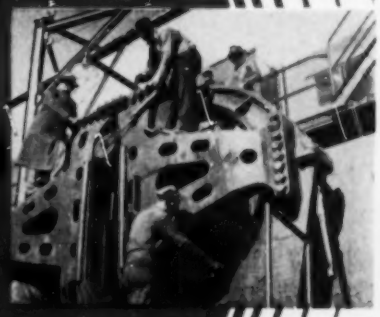
ANTI-FRICTION

PRESSURE-PROOF

THEY ALL POINT TO

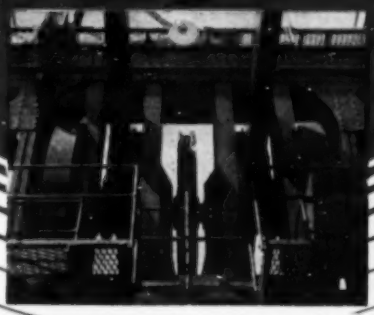
WHITMORE'S

Lubricants



GEAR PROTECTION

FOR CABLES & ROPES



We know from long, hard experience that there is no one cure-all lubricant for every purpose. As a matter of fact, requirements of the same gears, bearings, etc. vary from one piece of equipment to the next. Each needs to be studied—lived with—to gain the full knowledge as to just what lubricant will really do the job. Therefore, Whitmore Engineers do live on the job during an extensive survey which will give the answers —we guarantee it! Write or call us today. Let us prove that we can save you money through prolonged life of parts—elimination of breakdown time and increased efficiency.

Serving the Mining Industry for more than Half a Century

WHITMORE'S

PRESSURE-PROOF

LUBRICANTS

SUPER E. P.

more and more MANITOWOCS on more and more stripping operations

Peter Kiewit & Son move in big MANITOWOC 4500 to strip Fortune Lake Development

Another big stripping job, and another big Manitowoc takes over. The Fortune Lake open pit mine, in Northern Michigan, owned by Pickands Mather & Co., is being stripped by veteran contractor Peter Kiewit & Son of Omaha, Nebraska.

Kiewit knows earth-moving and knows his equipment too. On the job went a 5 yd. Manitowoc Dragline to handle the difficult assignment. The Manitowoc 4500 had proved its mettle many times previously — proved its ability to lick tough jobs, profitably — so it was only natural to have a 4500 break ground.

Whether it's ore or coal, mining or stripping, you too will find a Manitowoc the most profitable investment you can possibly make. Included in the Manitowoc line are special hi-lift shovels, long reach draglines, designed for mining and stripping. May we send you complete information? Manitowoc Engineering Corporation, Manitowoc, Wisconsin.

MANITOWOC SHOVELS Speedcrane 1-5 YD. CRANES 18-100 TON

ON THOSE HEAVY DUTY BELT CONVEYORS . . . USE

Jones

HIGH TENSILE ALLOY IRON CONVEYOR PULLEYS

- Tailor-made to meet your requirements in standardized designs for belt tensions up to 1500 pounds per inch of face.
- Mounted on shafts with Jones-Timken pillow blocks and couplings factory assembled to simplify field erection.
- Drive Pulleys with plain or grooved lagging.

End view of Jones 60" x 44" Pulley showing heavily ribbed arms and split shrunk hub.

Jones 60" x 32" Rubber Covered Pulley, mounted on 9" Jones-Timken Pillow Blocks.

- JONES is the prime source of supply for complete drives to HEAVY INDUSTRY.
- *Ask for Catalog No. 83*
- Herringbone — Worm — Worm-Helical — Spur Gear Speed Reducers • Cast Iron Pulleys • V-Belt Sheaves Timken Pillow Blocks • Flexible Couplings • Cut Gears

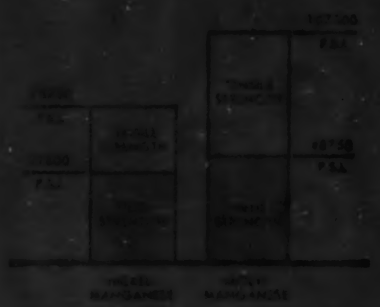
W. A. Jones Foundry & Machine Co.
4401 West Roosevelt Road, Chicago 24, Illinois

Since 1890 . . . In the Service of Industry

AMSCO V-MANG

The new moly-manganese electrode that's better than nickel-manganese rods for build-up and repair

- TOUGHER DEPOSIT
- BETTER WELDABILITY
- HIGHER YIELD STRENGTH
- LESS CRACKING



Comparison of yield and tensile strength

For full engineering and metallurgical information on Amsco V-Mang, write for technical data sheet to Amsco, Chicago Heights, Illinois.

AMSCOATING
THE RIGHT WAY TO SAY HARDFACING

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
409 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Factories: Chicago Heights, Ill., Denver, Oakland, Cal., Los Angeles, Pa. Affiliate: Canadian Steel Foundries, Ltd., Montreal, Que.

COAL MEN ON THE JOB

LONE STAR STEEL CO., McAlester, Okla.: A. W. Schneider (left), mine superintendent, and R. L. Greer, outside foreman, Carbon No. 5 mine.

City, will manage the new warehouse.

Buffalo Steel Div., H. K. Porter Co., Inc., Tonawanda, N. Y., has appointed F. B. Pinzel assistant general sales manager. Before joining Buffalo Steel Div. Mr. Pinzel was with the Republic Steel Corp., where he had been engaged in sales for more than 8 yr.

Mine Safety Appliances Co., Pittsburgh, has made Richard Crawford managing director of its British subsidiary. A native of London, Mr. Crawford had been general sales manager of Mine Safety Appliances Co., Ltd., Glasgow, Scotland. Well known in international mining circles, Mr. Crawford was chief electrical engineer for the National Coal Board in Britain, joining M.S.A. in 1951.

Pyramid Steel Co., Cleveland, Ohio, has appointed L. R. Fletcher sales manager of the newly created Welding Steels Div., coordinating and directing all distribution and sales activity of the division.

Timken Roller Bearing Co., Canton, Ohio, has announced a multimillion-dollar expansion program for its Bucyrus (Ohio) plant. Included in the plans are new machinery, a new toolroom, office building, locker room and cafeteria building, and a boiler plant. Construction cost is expected to run about $1,250,000, and new manufacturing equipment for the project will be approximately $2 million. The proposed production facilities are expected to be in full operation by the end of 1954.

Norton Co., Worcester, Mass., held a week-long open house last month to unveil the new $6,000,000 expansion of its Grinding Machine Div., designed to provide increased capacity for the production of Norton's complete line of 45 different types of precision grinding and lapping machines. The new plant, built

(*Continued on p 268.*)

W. O. & M. W. TALCOTT, INC.

Cordially Invite You
to inspect
our exhibit of

TALCOTT { *Belt Fasteners and Acme Patches*

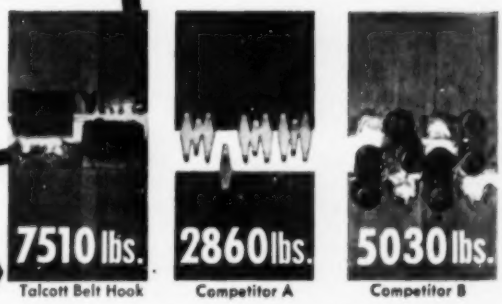
AT BOOTH No. 937

1953 Coal Show
American Mining Congress
Cleveland, May 11-14

Without obligation, bring us the toughest questions your men on the "belt line" can think up. We have the answers all ready for you!

You Be the Judge of your SAVINGS

with **TALCOTT** *Belt Fasteners*

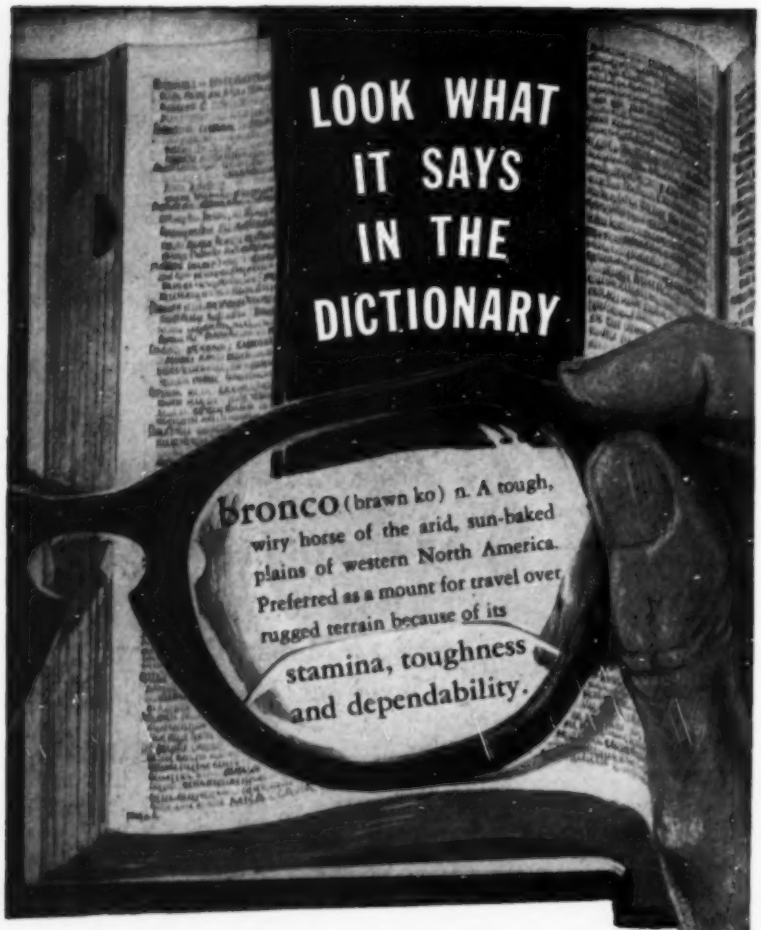


At our expense convince yourself with this *free test:* On any individual surface conveyor belt, make a joint with Talcott Fasteners. Work it hard — then figure your savings through longer belt life without breakdowns, due to our fasteners' close pliable joint that sets records for break-resistance. Finally, multiply proved savings on this test by your total number of belts in use — and you'll have good reason to send us your order for a complete Talcott Fastener installation. Fair enough?

Send for Free Samples

Without obligation, write for free samples of Talcott Fasteners for testing. State kind of belting (leather or rubber? transmission or conveyor?), width, thickness or number of plies, extra covers or not, diameter of smallest pulley. Ask about Talcott Fasteners for patching, too.

W. O. & M. W. TALCOTT, INC. Providence, R. I.


LOOK WHAT
IT SAYS
IN THE
DICTIONARY
Bronco (brawn ko) n. A tough, wiry horse of the arid, sun-baked plains of western North America. Preferred as a mount for travel over rugged terrain because of its
stamina, toughness and dependability.

that's why we call our portable cords and cables

BRONCO 60 *Certified*

It has a tough hide of 60% *by weight* Neoprene that is highly resistant to sunlight, ozone, oil, acids and alkalis. *Certified* has a heart of 99.9% pure soft annealed fine-stranded copper conductors coated with super-aging Cold Rubber insulation. Synchro-curing gives it stamina and flexibility. Jackets are branded with complete data; "BRONCO" repeated every two feet makes it easy to measure. To get the most dependable, flexible, convenient cord made, always specify Bronco 60 *Certified*.

WESTERN INSULATED WIRE CO.
Los Angeles 58, California

to meet the demands of the present defense effort, consists of 740x300-ft factory joining a 360x100-ft office building The factory itself is of single-story modern construction, providing 275,000 sq ft of working space and enlarging the company's machine-tool manufacturing capacity by about 50%.

The General Tire & Rubber Co.'s plans for expansion in the chemical, foam-rubber and rigid-plastics fields were approved by its board of directors in their annual meeting. Major steps in General's over-all expansion program, the transactions now approved include the sale of General's stock interest in the Mansfield Tire & Rubber Co. to executives of that company and others, the building of a multi-million dollar chemical plant near Ashtabula, Ohio, the broadening of its foam-rubber operations, now at Logansport, Ind., and the opening of a rigid-plastics division at Marion, Ind. General's second chemical facility is expected to cost approximately $6,000,000 and ground will be broken in the next few weeks at the 50-acre plant site near Ashtabula. Re-tooling of Marion facilities has already started, and first shipments of plastics products to be manufactured have already been completed through pilot-plant operations at General's Wabash and Logansport plants.

Black & Decker Mfg. Co. broke ground last month to begin construction of a $2,000,000 addition to its Hampstead, Md., branch plant. The 126,800-sq. ft. addition, which will double the size of the present Hampstead branch plant, is scheduled to be completed by November, but partial operations, will begin as early as September. The Hampstead plant, which opened a year ago, now employs 600 people, and the new addition will create new jobs and increase personnel to an estimated total of 1,000 by November, 1954.

New Books for Coal Men

Converting Coal

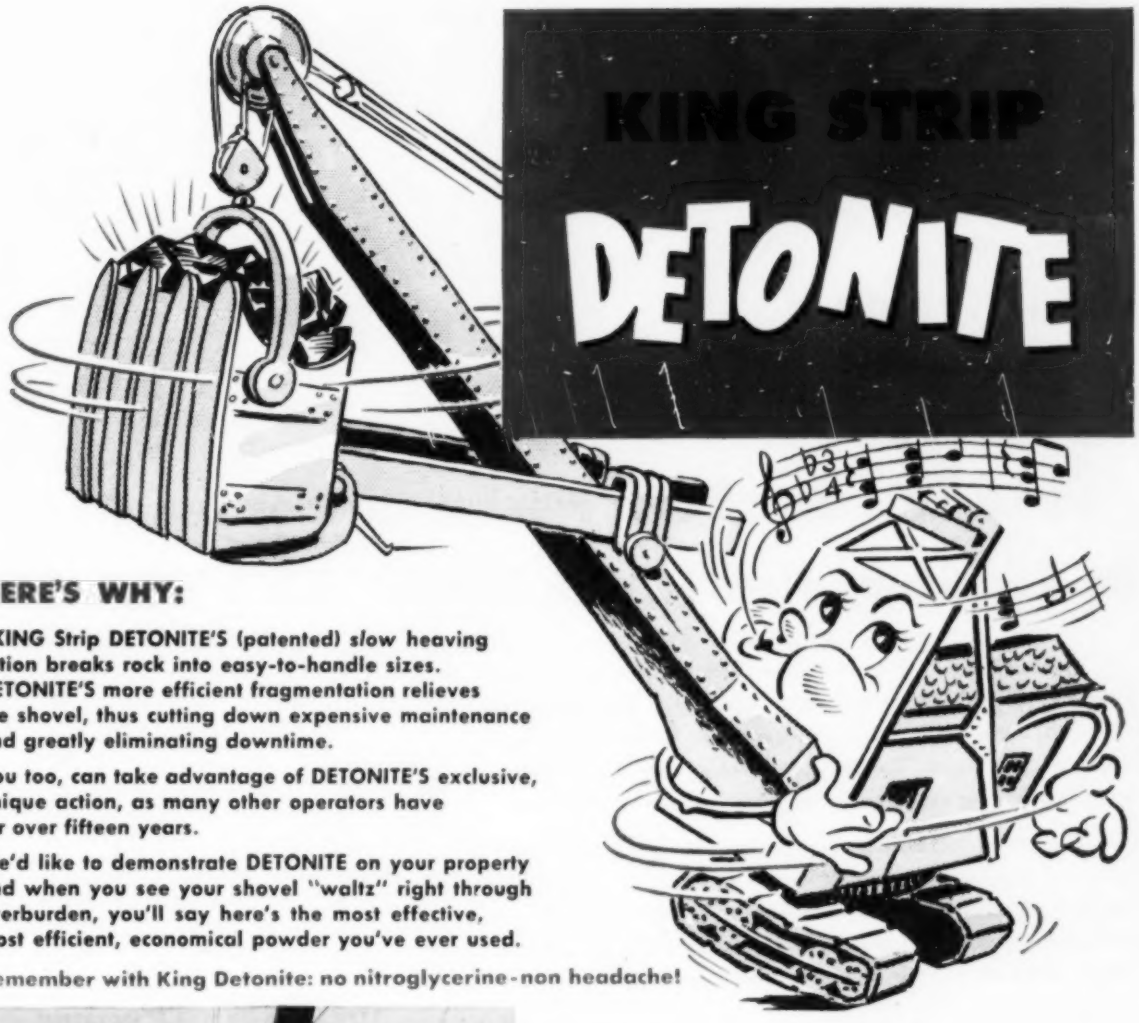
Gasification and Liquefaction of Coal, a Symposium. This volume contains 15 papers on improved gasification techniques, plant design, hydrogenation, chemicals from coal, underground gasification and gas economics. Problems still unsolved are surveyed. *221 pp. $4.20 to AIME members; $6 to non-members. American Institute of Mining and Metallurgical Engineers, 29 West 39th St., New York 18, N. Y.*

New Light on Heating

Heating, Ventilating and Air Conditioning Guide, 1953 Edition. This annual revision of an old standby adds a new section on snow melting; a new chapter on water vapor and condensation in building construction; new information on industrial oil and gas burners, warm air system design and unit heaters; and new presentations on electric heating and industrial exhaust systems. *1,560 pp.*

(Continued on p 272.)

shovels WALTZ through overburden when you use...



HERE'S WHY:

KING Strip DETONITE'S (patented) *slow* heaving action breaks rock into easy-to-handle sizes. DETONITE'S more efficient fragmentation relieves the shovel, thus cutting down expensive maintenance and greatly eliminating downtime.

You too, can take advantage of DETONITE'S exclusive, unique action, as many other operators have for over fifteen years.

We'd like to demonstrate DETONITE on your property and when you see your shovel "waltz" right through overburden, you'll say here's the most effective, most efficient, economical powder you've ever used.

Remember with King Detonite: no nitroglycerine-non headache!

The photograph was taken after using King Detonite. Note especially the "easy to handle" rock sizes for ease in shovel handling.

Write or phone us today!

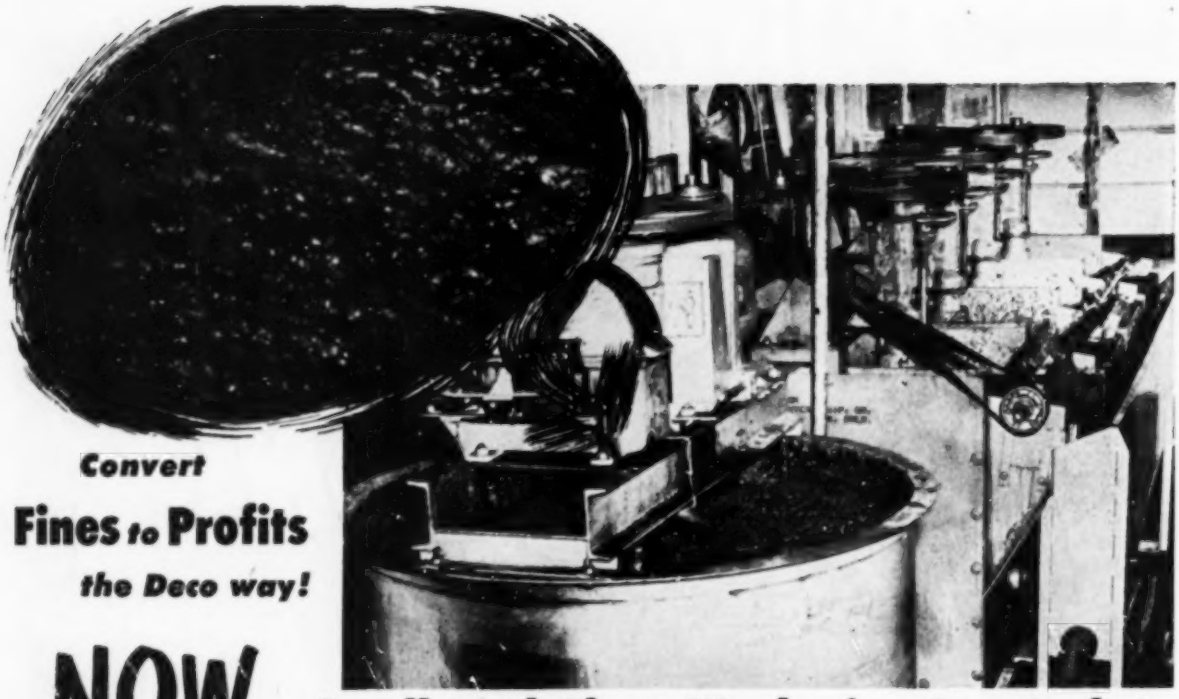
DETONITE

PATENTED SURFACE-SENSITIZED EXPLOSIVE

1878 1953

THE KING POWDER CO., INC.

CINCINNATI 1, OHIO



Convert

Fines to Profits

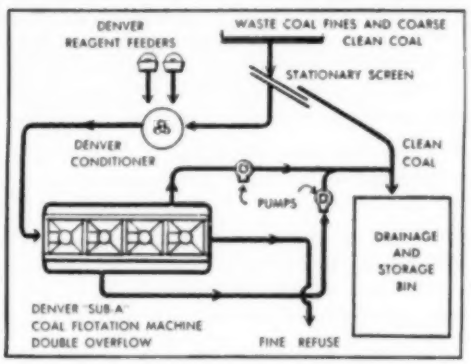
the Deco way!

NOW...Small Coal Plant Washeries Can Cash In On Reclaiming Fines...with Denver "Sub-A" Flotation!

Denver "Sub-A" Flotation gives operators of small washeries a low-cost method to recover fines at extra profits. You can recover a low-ash, clean coal product (—20 mesh to 0 mesh) that would otherwise be wasted. Recovery of fines can be the difference between breaking even and profit.

Coal fines, increased with mechanized mining, can now be recovered and cleaned with flotation. You reduce stream contamination, and you get a marketable product because of low-ash and sulphur content. Marketing is easy! Many washery operators simply add fines to their regular market product.

Why not cash in on extra recovery and make more profits with Denver "Sub-A" Flotation. Eliminate washery waste. Denver Equipment Company is the world's largest manufacturers of Flotation Machines. Let Denver Equipment Company engineers suggest an economical flotation layout for your washery or breaker—regardless of size. Find out about Deco's coal flotation test. Write, wire or phone today!



TYPICAL DENVER "SUB-A" FLOTATION RESULTS FOR FINE COAL FLOTATION

PRODUCT	% Weight	Analysis % Ash	Density % Solids
Feed to Flotation	100.0	23.5	20.0
Coal Flotation Concentrate	77.6	6.4	36.5
Refuse Waste	22.4	82.8	7.8

Reagent cost per ton of coal concentrate, 6.5c.
Moisture in filter cake, 21.5%.
Size analysis flotation feed, 20 x 0 mesh.

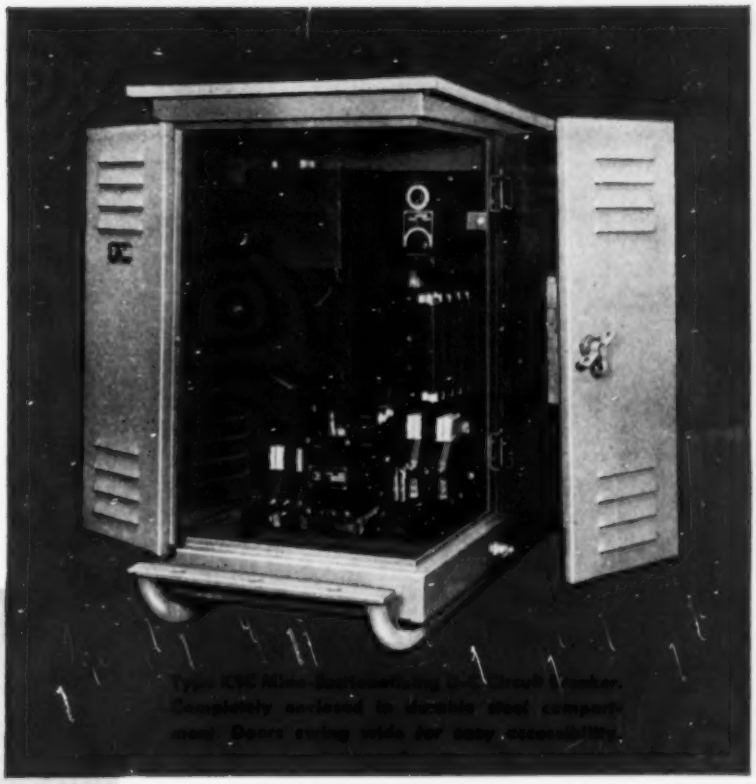
DECO FLOTATION ENGINEERS — DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

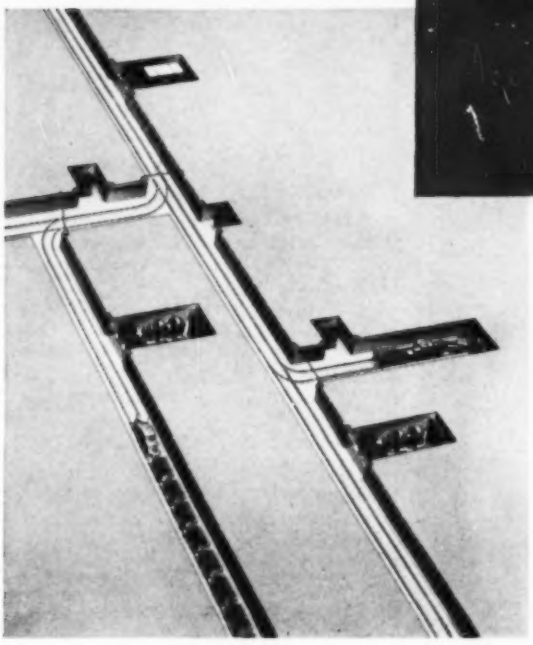
OUR 25TH YEAR OF FLOTATION ENGINEERING

DENVER EQUIPMENT COMPANY

1403 17TH STREET — DENVER, COLORADO

Improve safety- insure production





Recommended d-c sectionalizing practice

Sectionalizing switchgear should be installed—

- at substations
- between substations
- at intervals in power lines
- at main branch circuits
- at secondary branch circuits
- at pump circuits or other fixed-load circuits
- at each mining setup

Catalog Section 2503 gives full selection and application details. Write for a copy.

Sectionalize your electrical distribution with I-T-E circuit breakers

It's good business—as well as good safety practice—to install I-T-E d-c Sectionalizing Switchgear. If there's trouble in one area, it can't spread to tie up an entire mine. Outages are localized; other mine areas continue to produce.

I-T-E Type KSC Sectionalizing Circuit Breakers meet the high safety standards set by the Bureau of Mines. These rugged units can be strategically located at critical spots throughout the mine network. They will open instantaneously on overload, short circuit, or voltage failure—reclose automatically to restore power the instant line conditions become safe again.

To protect production, equipment, and personnel—*sectionalize* with I-T-E.

I-T-E CIRCUIT BREAKER COMPANY

19TH AND HAMILTON STREETS · PHILADELPHIA 30, PA.

POWER SWITCHING EQUIPMENT: R & IE EQUIPMENT DIVISION, GREENSBURG, PA.

SWITCHGEAR • UNIT SUBSTATIONS • ISOLATED PHASE BUS STRUCTURES • CIRCUIT BREAKERS • MECHANICAL RECTIFIERS • RESISTORS • SPECIAL PRODUCTS

See this equipment in operation at the Cleveland Coal Show. Visit the I-T-E exhibit—Booth 2303

CELAB RECTIFIERS

Direct Current for mining is easily obtained with CELAB SELENIUM RECTIFIERS. Portable, plug-in units provide DC power anywhere. LIGHT WEIGHT, HIGHER EFFICIENCY and BETTER POWER FACTOR are big items in cutting costs. IF YOU HAVE NEVER USED A METALLIC RECTIFIER for driving COAL MINE MACHINERY, GET OUR BULLETIN 124 TODAY.

Instant delivery on units up to 300 KW.

Also rental units with rent applied on purchase. NEW LOW PRICES NOW IN EFFECT.

CLARK ELECTRONIC CORPORATION

Phone Palm Springs 8-3011

PALM SPRINGS, CALIFORNIA

Eliminate 70% to 90% of Conveyor Downtime

U. S. Pat. No. 2548299—Others Pending

EVERYTHING is contained INSIDE the pulley shell!

HERE'S a money-saving departure from conventional conveyor drives. A Cedarapids-Schrock *Motorized* Head Pulley is simply a new application of the long-proven gear reduction drive, with everything . . . electric motor, reduction gears and all moving parts . . . contained inside the drum, completely protected from grit, dirt and weather and with no outside parts or motors to service. 70% to 90% of conveyor trouble and downtime is saved by eliminating the exposed parts necessary with conventional pulley drives. In operation, the pulley shell rotates about the electric motor which is held stationary by a torque arm attached to the conveyor frame. The speed of the shell depends on the combined reduction ratio of the pinions and gears inside the shell. Compact, easy-to-install, job-proved Motorized Head Pulleys are available in sizes from 5 to 30 HP and in various widths.

Find out all the advantages of converting your belt conveyor or belt-bucket elevator installations to *motorized* efficiency before you need head pulley replacements. See your distributor today, or write for Bulletin MP-1.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

Built for sale in Arizona, California, Nevada, New Mexico, Southern Oregon, Southwestern Utah and Texas by
YUBA MANUFACTURING CO.
(Pulley and Sprocket Department)
Benica, Calif.

$7.50, American Society of Heating & Ventilating Engineers, 62 Worth St., New York 13, N. Y.

Better First Aid

Unit First Aid Kits, Data Sheet D-202. Here's a help in selecting materials for first-aid kits. The data sheet recommends unit materials geared to some 25 occupations, based on the items most generally used in a given industry. *17c each; quantity prices on request. National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.*

Keeping Air Clean

Atmospheric Pollution, by A. R. Meethem. This book, written by a Britisher about air pollution in Great Britain, deals mostly with wastes from fuel combustion—smoke, ash and sulphur dioxide—and the damage to health and property caused by foul air. It is aimed at those people who are professionally concerned with air pollution. It discusses various kinds of wastes from various types of burning units, the effects of weather on pollution and ways and means of reducing emission of smoke, gas and cinders. *269 pp. 6x9-in; boards. $4.90, Pergamon Press, Ltd., 2, 3 & 5 Studio Place, Kinnerton St., London, S. W. 1.*

Other Books and Booklets

Report on the Resources and Washability of the Meigs Creek Coal in Ohio—Part I, Reserves, by Township and County, by W. H. Smith, R. A. Brant and F. C. Amos; **Part II, Washability,** by P. O. Krumin. Free, Division of Geological Survey, Ohio State University, Columbus 10, Ohio.

Lignite Resources of North Dakota, by R. A. Brant. Cir. 226, USGS. Free, Geological Survey, Washington 25, D. C.

The following publications by the Bureau of Mines may be obtained free upon request to Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. All are 8 x 10½-in; paper; mimeo.

Gasification of Lignite in a Commercial-Scale Pilot Plant, Progress Report for 1947-48, by A. C. Burr, J. C. Holtz, W. H. Oppelt and A. W. Koth. R. I. 4940. 28 pp.

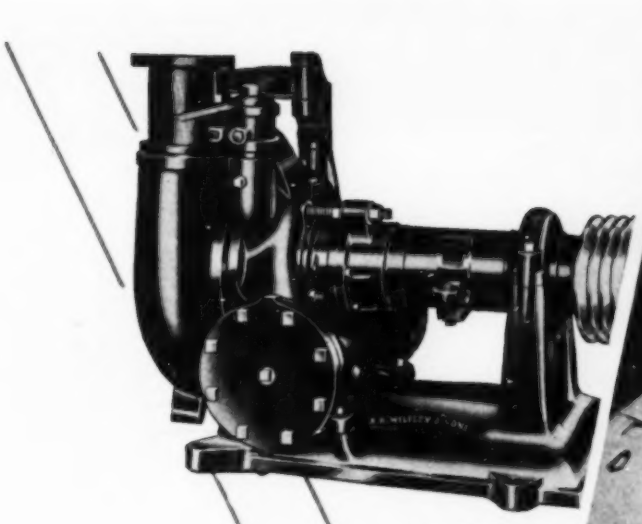
Anthracite Mechanical Mining Investigations, Progress Report 9: Measurements of Loads Borne by Underground Roadway Supports, by Andrew Allen Jr., P. H. Kaar and J. D. Cooner. R. I. 4946.

Fatalities at Pennsylvania Anthracite Mines in 1952. H. S. S. 417.

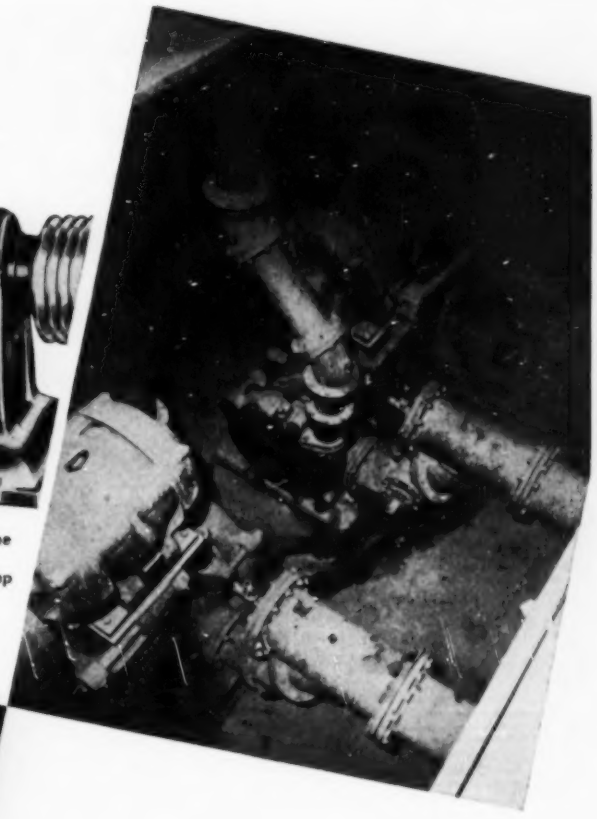
Washability Study of the Upper Hartshorne Bed at Quality Mine, Hackett, Ark., by B. W. Gandrud and H. L. Riley. R. I. 4964.

Preparation Characteristics of Coal from Jefferson County, Pa., by W. L. Crentz and J. W. Miller. USBM, R. I. 4941.

Certain Aspects of the Galvanic Corrosion Behavior of Titanium, by David Schlain. R. I. 4965.



Companion to the famous Wilfley Acid Pump



Cement Slurry

In cement plants all over the world where slurries, sands or slimes are handled, famous WILFLEY Sand Pumps are delivering continuous, trouble-free performance 24 hours a day without attention. Wherever WILFLEYS are used, the record reveals stepped-up production and cost-saving efficiency. There is an economical WILFLEY pump size for every pumping requirement. Individual engineering on every application. Write or wire for complete details.

Buy **WILFLEY** *for Cost-Saving Performance!*

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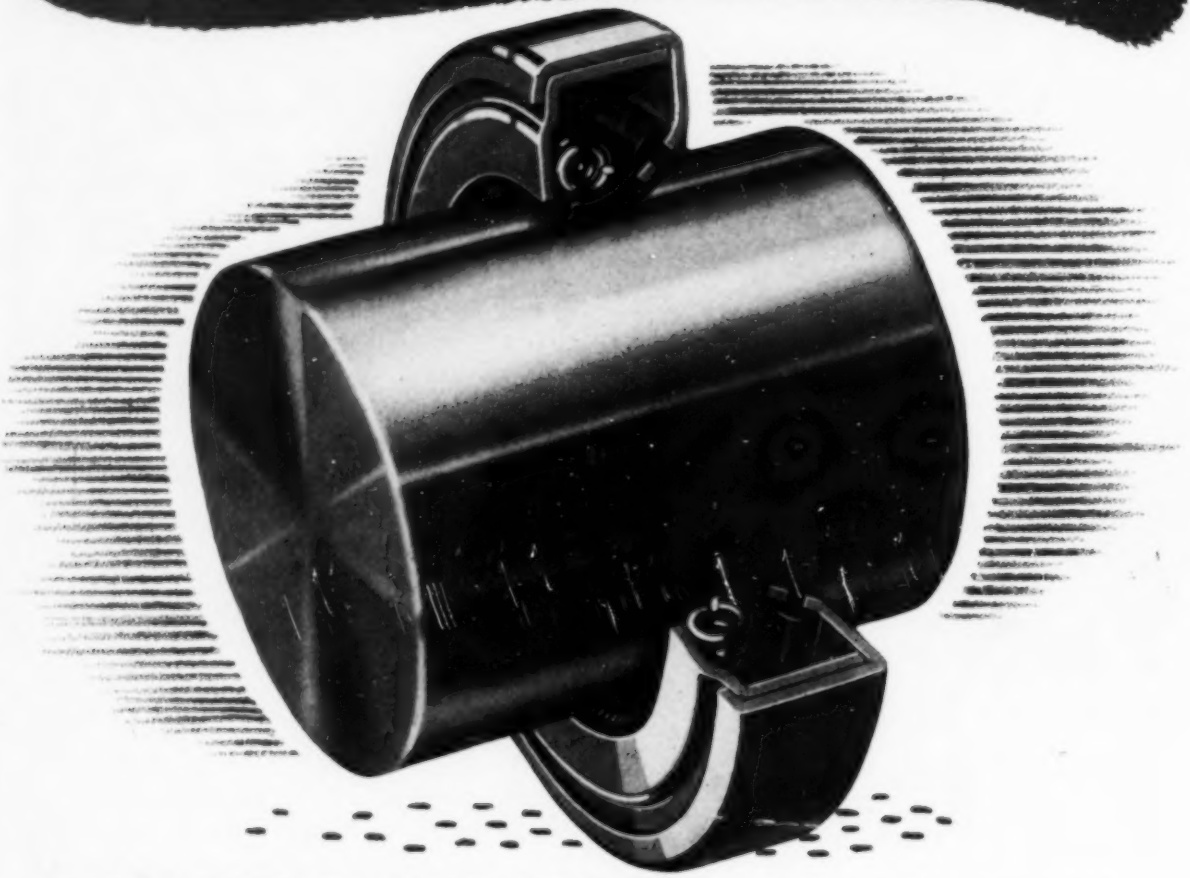
DENVER, COLORADO • U. S. A.
New York Office: 1775 Broadway, New York City

WILFLEY
centrifugal PUMPS

SEAL OUT DIRT . . . SEAL OIL IN!



VICTOPRENE (SYNTHETIC RUBBER) OIL SEALS

TYPE H This is the standard seal in the Victoprene line. It meets the requirements of the majority of applications, and is available for the greatest range of sizes. Its famous molded synthetic rubber sealing element is bonded to the metal shell. Constructed with a double outer wall for long life, and an accurate press fit is assured at seal periphery. A complete list of sizes of Type H is now available.

TYPE K This seal embodies the most advanced engineering in the field of metal encased, unit type fluid seals. It is outstanding for extreme temperatures and high shaft speeds. The sealing element assures maximum flexibility and reduction of frictional drag. The pressure sealing lip has proven to be as much as 60% better than that of old type seals.

WEST VIRGINIA BEARINGS • • 1516 Kanawha Blvd., West • CHARLESTON 2, WEST VA.
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KENTUCKY BALL AND ROLLER BEARING CO. • 215 S. Floyd • LOUISVILLE, KY.

Divisions of BEARING SPECIALISTS, INC.

PHOTO BY A. DEVANEY INC.

HEADQUARTERS FOR EXPLOSIVES

Hercules Powder Company welcomes all visitors to the American Mining Congress 1953 Coal Convention and Exposition, May 11-14, Cleveland Public Auditorium. Drop in to see us at Booth No. 1421, in the Arcade, and learn the latest about Hercules' complete line of explosives and blasting supplies for coal stripping and underground use. If you cannot make the Show, do the next best thing — write for a copy of "Hercules Explosives and Blasting Supplies."

Explosives Department

HERCULES POWDER COMPANY

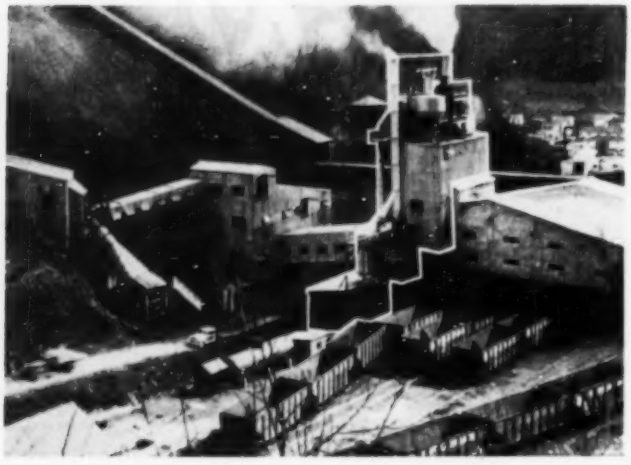
INCORPORATED

936 King St., Wilmington 99, Del.

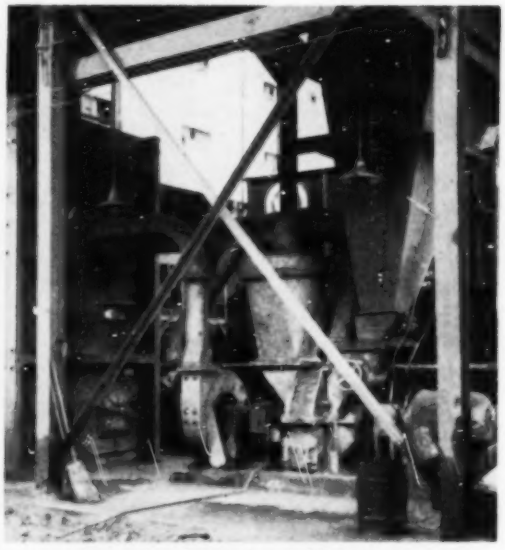
XR53-2

C-E RAYMOND *Flash Drying...*

shows outstanding results at Red Jacket Coal installation



New Red Jacket plant addition is section outlined in white.



Raymond coal pulverizer and furnace are automatic in operation.

THE Red Jacket Coal Corp. reports excellent results from the C-E Raymond Flash Drying System installed at their #12 Mine, Coal Mountain, Wyoming County, W. Va., for the new carbon-drying-and-cleaning addition to their preparation plant.

Before the air cleaning operation, the raw 3/16" x 0 coal is pre-dried in the C-E Raymond Flash Dryer, where the initial moisture content of 10% to 15% is reduced to 2% to 3%. The Flash Drying operation results in no deterioration whatsoever in the quality of the coal.

The Flash Dryer Column elevates the fine coal to the cyclone collector. The coal then passes through an airlock to the air table. The ash reduction made by the table ranges from 6% to 9%. The table makes four products: clean coal, middlings, refuse and dust.

By removing the moisture and lowering the ash this new system has upgraded the 3/16" x 0 coal by about $1.50 per ton. The dust from the table cyclone, ordinarily discarded as refuse, is used to fire the Flash Dryer unit, thus eliminating fuel costs.

Write for Bulletin FD-51 for details of C-E Raymond Flash Drying of Fine Coal

Electrical-control center of plant . . . one man handles operation and maintenance of furnace.

COMBUSTION ENGINEERING – SUPERHEATER, INC.

Flash dryer division

1315 North Branch St. Chicago 22, Illinois

THE FINEST IN COILS AND BRASSES

for the Coal Mining Industry

WEST VIRGINIA ARMATURE COMPANY

COAL SHOW BOOTHS 632-634

★

EXPERIENCE

QUALITY

SERVICE

★

Since we have been repairing and rebuilding mining equipment since 1910, we have the "KNOW HOW". Let us use this experience to help you.

Quality materials plus expert workmanship combined with our knowledge of your needs make our COILS and BRASSES the best in the field. Don't scrap your burned out flat wire fields. We can save you money by rewinding and reinsulating them. Get the most for your money by using our CUSTOM BUILT parts for mining machines.

Eight well stocked warehouses, strategically located, provide quick, efficient sources of supply.

WEST VIRGINIA ARMATURE COMPANY

BLUEFIELD - FAIRMONT - WILLIAMSON

West Virginia

BRANCHES

Mine Supplies, Inc., Montgomery, W. Va.
Service Machine & Electric, Grundy, Virginia
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MIDWEST DISTRIBUTOR

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HUMBOLDT

Since 1856

Mines Equipment, Mineral Dressing Plants, Crushing and Grinding Machinery, Cement Mill Outfit, Metallurgical Works, Coal Preparation Plants, Steel Constructions for Buildings and Bridges.

DEUTZ

Since 1864

Otto-Gas-, Diesel-Engines for Every Purpose of Two- and Four-Stroke design, Output range 3–1500 H.P. Cooled by water or air, Diesel-powered tractors, Diesel locomotives, Gas producer plants.

MAGIRUS

Since 1864

Trucks and busses driven by air-cooled DEUTZ Diesel engines, Vehicles for municipal services, Fire ladders, fire engines, Fire fighting water trucks, Two-wheeled ladders, Fire fighting equipment.

KLÖCKNER-HUMBOLDT-DEUTZ AG · KÖLN U. ULM

Send inquiries to either Köln, Germany or Ulm, Germany

ENSIGN EQUIPMENT FOR MINES

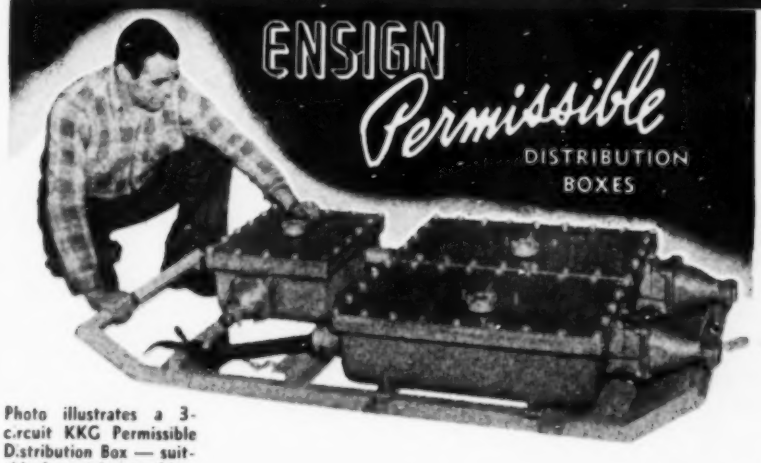


Photo illustrates a 3-circuit KKG Permissible Distribution Box — suitable for cutting machine, loading machine and drill.

Enclosures are heat-treated aluminum alloy with heat-treated aluminum cover plates.

Rugged construction — light weight.

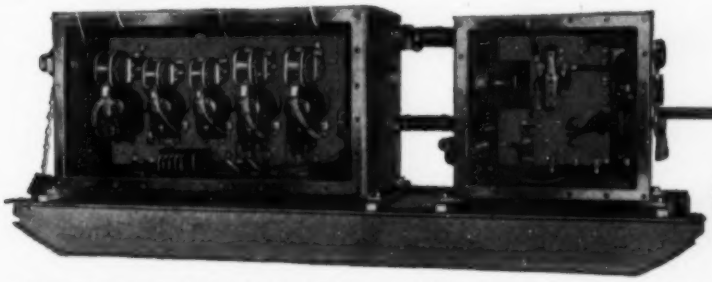
Boxes incorporate three-pole circuit breakers with shunt trip attachment for tripping breaker, plus ground current limiting device.

ENSIGN safety lever action plugs.

ENSIGN design permits use of standard three-conductor mining cable.

Also available in dust-tight Enclosures.

VISIT OUR DISPLAY AT
CLEVELAND COAL SHOW
BOOTHS 2558—60—62



ENSIGN-CLARK

EXPLOSION-TESTED STARTER FOR 2-SPEED CONVEYOR BELT

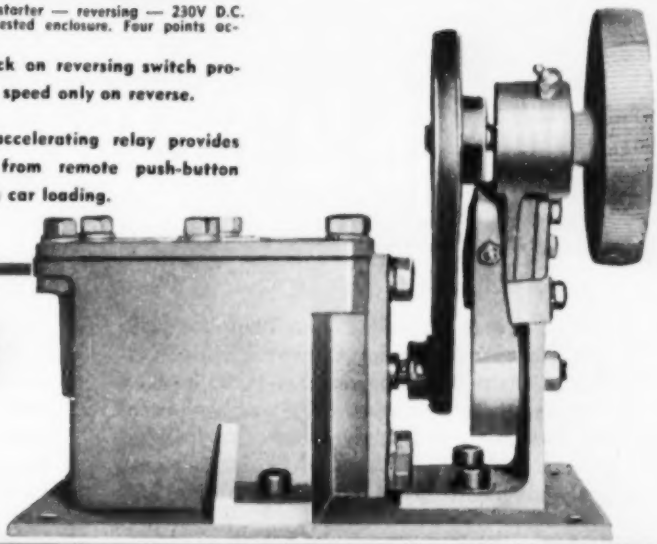
Photograph illustrates 50/25 H.P. Bulletin 5392 Type ADJR starter — reversing — 230V D.C. for two-speed motor operation. Bureau of Mines explosion tested enclosure. Four points acceleration. Skid mounted.

1. Adjustable speed 2 to 1 ratio when used with adjustable speed motor.
2. Full field on starting.
3. Three position selector switch provides independent or sequence operation.
4. Interlock on reversing switch provides half speed only on reverse.
5. Field accelerating relay provides speed-up from remote push-button for shuttle car loading.

The Watchdog of your Conveyor System

BULLETIN 1101 CENTRIFUGAL SWITCH
—with Explosion Tested Enclosure

ENSIGN Bulletin 1101 Centrifugal switch for Belt Conveyors provides belt protection and sequence operation of multiple conveyors, including shaker or Chain Conveyors feeding onto Belt Conveyor. Bulletin 1100 with Dust Tight Enclosure.



ENSIGN ELECTRIC & MANUFACTURING CO.

HUNTINGTON, WEST VIRGINIA

Weigh it on the way.....

Cut costs and streamline your operation with this Fairbanks-Morse Belt Conveyor Scale . . . it cuts out extra handling and weighing at a remote point. For example, here it weighs the coal *automatically* as it moves from the scalping screens to the wash box. This Fairbanks-Morse Scale has a capacity of 700 tons an hour at 400 belt feet a minute, and you can get accumulated totals with the remote tonnage register from a central control room *and* with the mechanically operated register at the scale itself. See your Fairbanks-Morse Weighing Expert. Or if you prefer, write for complete details to Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth remembering when you want the best

SCALES • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY • PUMPS • HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGNETOS

ACTUAL SIZE

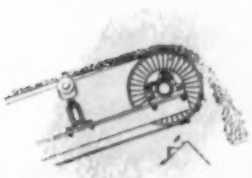
DUMB-BELL?...

. . . NO,

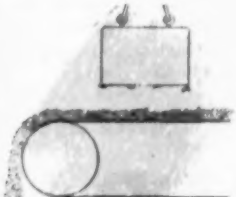
it's a hunk of iron that found its way into a coal pulverizer in a Wisconsin plant. Its scarred surface tells a sad story about that pulverizer and its unhappy owners, who've learned how economical an investment a magnet can be . . . the hard way.

Any plant that doesn't have a magnet to protect processing machinery ought to compare the cost of tramp iron trouble with the cost of a magnet.

And if your old magnets aren't doing the job, learn about the new, improved types available. *Write Dings today for* CATALOG C-5000-B.



Dings Magnetic pulley installed as head drive pulley on conveyor belt. Iron separated, discharged automatically.



Dings Rectangular Suspended Magnets pull iron out of deepest burdens, fastest moving conveyor belts.

RS153

Dings

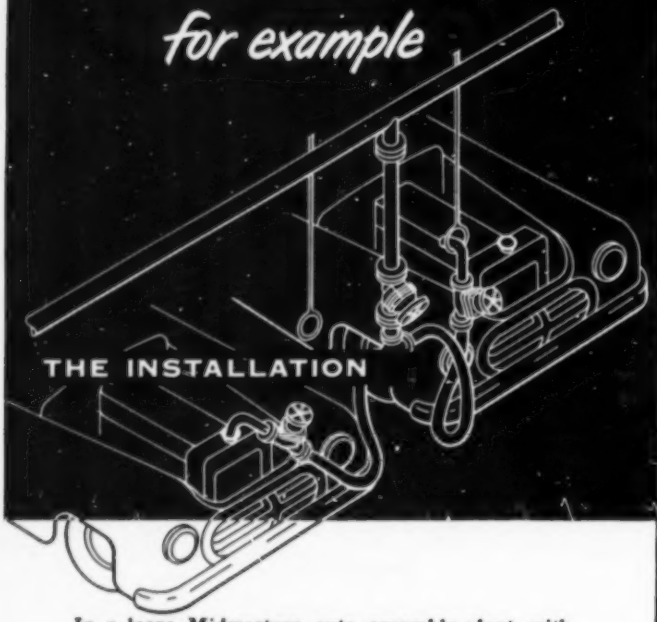
MAGNETIC SEPARATOR COMPANY

4720 W. Electric Ave., Milwaukee 46, Wisconsin

See us at the show — Booth 132

Magnetic Separation Leader for over Fifty Years

How Valve Life Changed from Days to Months ...on Crystalline Liquids, for example



In a large Midwestern auto assembly plant, with Crane Diaphragm valves in alcohol solution anti-freeze fill lines to automobile radiators.

VALVE SERVICE RATINGS

SUITABILITY:	Doing the job O.K.
FEATURES:	Packless; no leakage around stem
MAINTENANCE COST:	None
SERVICE LIFE:	Now 25 times longer than any valve used
OPERATING RESULTS:	Damage to production stopped
PRICE:	O.K. No premium
AVAILABILITY:	Regular Crane Catalog item. No. 1610

THE CASE HISTORY

None of the many conventional valves nor the plug cocks tried in this service lasted more than a week—about 2,000 operations.

The crystals present in anti-freeze would build up on seating surfaces and in the exposed valve stem threads. The valves leaked and were hard to operate. To the excessive maintenance needed was added the high cost of frequent damage to automobile finish by anti-freeze leakage.

Now Crane Packless Diaphragm valves control the trouble. Their sealed bonnet prevents contact of fluid and working parts; their seating design isn't hindered by crystal deposits. At last report, Crane valves have given over 50,000 trouble-free operations with no maintenance, and with indefinitely longer life assured.

THE VALVE

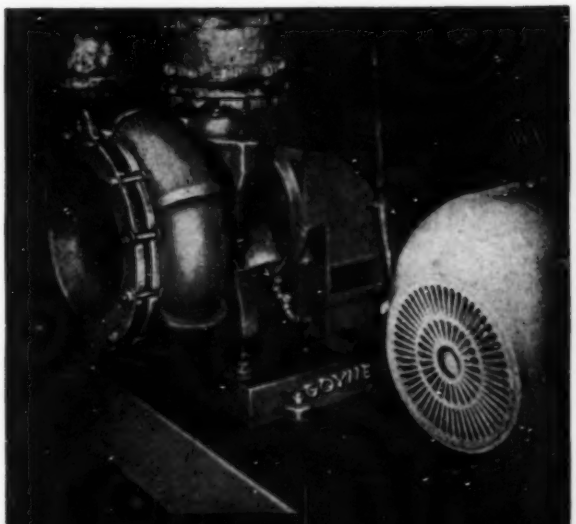
In Crane Diaphragm valves, the diaphragm serves only to seal the bonnet, not for seating. It isn't pinched or stressed when valve is closed. Independent disc gives control of fluid even should diaphragm fail. These valves are made in a wide variety of body, diaphragm, disc-insert, and body-lining materials to handle countless corrosive, abrasive, or ordinary services. See your Crane Catalog or local Crane Representative.

THE BETTER QUALITY...BIGGER VALUE LINE...IN BRASS, STEEL, IRON

CRANE VALVES

CRANE CO., *General Offices:* 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING



GOYNE
SOLIDS HANDLING PUMP

Feature:
LOW-COST OPERATION

GOYNE SOLIDS HANDLING PUMPS are extremely popular with a very large number of coal companies who find them quite reliable for pumping:

Liquids with solids added to increase specific gravities for coal and refuse separation in coal preparation plants.

Disposing of refuse and silt by pumping to waste material banks or for back filling into mined out areas.

Pumping prepared coal to temporarily desired storage areas.

These specially designed Goyne pumps incorporate numerous features to reduce upkeep and labor maintenance costs to a minimum:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing ***only the rear head of the pump.*** No suction or discharge piping or any other major part of the pump is disturbed.

2. The only packing box of the pump is subjected to the low suction pressure rather than to the discharge pressure developed by the pump. This feature assures long packing and shaft sleeve life.

3. Impeller clearance is adjusted while the pump is running, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. Spare parts are carried in stock at our plant for prompt shipment. Reduce your inventory by using Goyne Process Pumps.

All inquiries are given a thorough engineering analysis and our prompt attention.

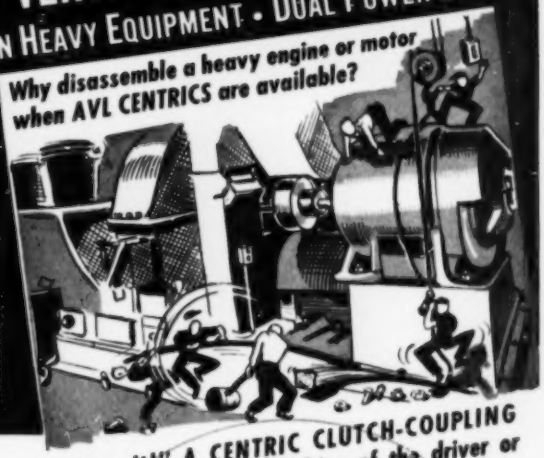
GOYNE MINE PUMPS 1881

The GOYNE STEAM PUMP CO.
ASHLAND, PA

"Easy does it!" with this CENTRIC VERTICAL LIFT COUPLING

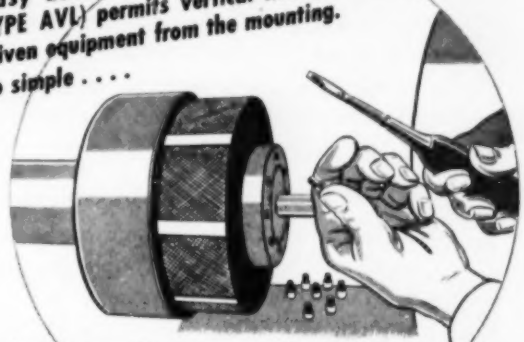
IN HEAVY EQUIPMENT • DUAL POWER DRIVES

Why disassemble a heavy engine or motor when AVL CENTRICS are available?



"Easy does it!" A CENTRIC CLUTCH-COUPLING (TYPE AVL) permits vertical lifting of the driver or driven equipment from the mounting.

So simple . . . .



. . . Just remove the screws on the CENTRIC . . . slide the inner driver member over the hub . . . lift vertically out without telescoping.

SIMPLIFIES MAINTENANCE

of blowers, car pullers, conveyors, crushers, elevators, fans, pumps etc.

SHORTENS SHUT-DOWN TIME

TYPE AVL IS AVAILABLE IN FULL RANGE OF CAPACITIES 5 TO 1500 H.P. INCLUSIVE

2400

CENTRIC CLUTCH COMPANY
P. O. BOX 175
MAIN ST. & STATE ROUTE 35
WOODBRIDGE NEW JERSEY

Does the wire rope you use earn this kind of TRUST?

Typical of many, one master mechanic says, "We *always* use Hercules Red-Strand wire rope, because we know we can trust it for long life and safe service . . . every time." An inspector reports, "On a work test, we really abused Leschen rope. It *more* than satisfied our requirements."

HERCULES Red-Strand deserves it

Why is that so? Simply because *higher-than-rated quality* in Red-Strand wire rope means *greater-than-expected* safety and performance.

If you're not getting this kind of praise from your men, you should try Hercules Red-Strand. Do it, next time you need wire rope.

HIGHER-THAN-RATED QUALITY

LESCHEN
WIRE ROPE AND SLINGS

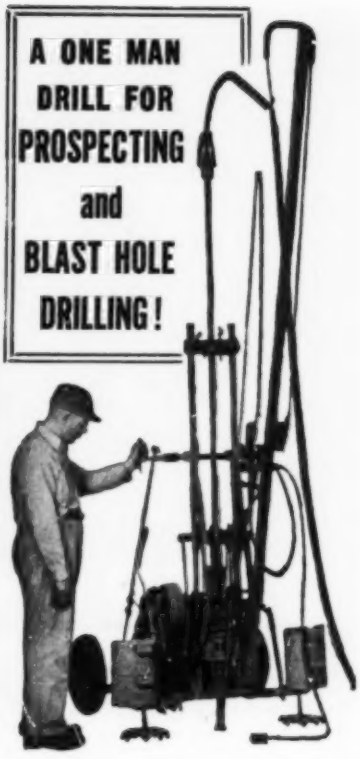
A. LESCHEN & SONS ROPE COMPANY

HERCULES® Red-Strand wire rope made by A. Leschen & Sons Rope Company, St. Louis 12, Missouri

In business only to make wire rope . . . better wire rope . . . since 1857

DISTRIBUTORS IN ALL PRINCIPAL CITIES

A ONE MAN DRILL FOR PROSPECTING and BLAST HOLE DRILLING!



THIS HOSSFELD ROCK DRILL

with prospecting attachment will cut your drilling costs to as low as 30c per foot . . . give you accurate samplings to 70 feet deep. It's a compact unit that can be moved into hard-to-get-at places.

- **POWERFUL DIRECT DRIVE**
- **ONE MAN OPERATION**
- **ECONOMICAL**

BLAST HOLE DRILLING can be done faster and better, too. Holes are full diameter all the way. Drills at any angle from vertical to horizontal.

WRITE TODAY for illustrated bulletin with full details.

DEALERS Write for franchise information TODAY.

Hossfeld Mfg. Co.
420 W. 3rd St.
Winona, Minnesota

Your Choice

STANDARD KERF...THIN KERF
OR SPECIAL MADE TO ORDER...

CUTTER BARS

"CINCINNATI"

CUTTER BARS ARE "FIRST CHOICE" IN MINE AFTER MINE FOR MORE THAN A QUARTER OF A CENTURY...

LIKE all CINCINNATI Coal Cutting Equipment, CINCINNATI CUTTER BARS are "First Choice" in mine after mine because year after year they operate efficiently under all conditions. They are manufactured of the same high quality materials and workmanship that have made Cincinnati time-tested coal cutting equipment outstanding. Made of all alloy steel and constructed to prevent spreading, the CINCINNATI BAR holds chain firmly in its track thereby increasing efficiency of the chain . . . . . reducing the power consumed and adding to the life of the equipment.

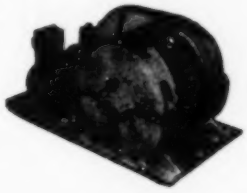
SPECIALISTS IN
COAL CUTTING EQUIPMENT

the CINCINNATI MINE MACHINERY CO.
CINCINNATI 25, OHIO

FLOOD CITY

Operating equipment for large or small mines

MINE HOISTS



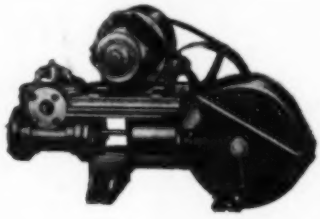
CAR SPOTTING HOISTS: A new design in which a 30 to 1 worm gear reducer replaces old style spur gear reduction. 5 hp motor gives rope pull of 6000 lbs. at 35 ft. per min. Drum immovable when motor is at standstill due to non-reversible worm drive. Rope capacity 500 ft. ⅝"; 750 ft. ½".

5 hp ROOM HOISTS: Friction clutch type, fully enclosed. Develops rope pull of 1200 lbs. with car resistance of 30 lbs. per ton at 140 ft. per min. Standard drums hold 600 ft. of ½" wire rope.

REPAIR PARTS
MAINTENANCE SERVICE

We make and stock bronze armature bearings, axle linings, journal brasses and bushings for Baldwin-Westinghouse, G. E., Goodman, Morgan-Gardner and Jeffrey Locomotives. Also for the mining machinery of Goodman, Jeffrey, Sullivan and Morgan-Gardner. We maintain a staff of service experts for this type of mining equipment, with complete machine shop and electrical shop for all types of repairs.

MINE PUMPS



Flood City Centrifugal Pumps from 1" to 6" capacity are available as well as Plunger Pumps. Our acid resisting bronze, cast in our own foundry, has been proven through years of experience and test. We also manufacture parts for any make or type of pump, and will be pleased to quote on specific parts to meet your needs.

WE MANUFACTURE: Mine Hoists, Drum Type Controllers, Pumps, Trolley Line Material and Poles, Cable Vulcanizers, Mine Switches, Electric Welding Machines, Field Coil Testing Machines, Armature and Field Coils, Gears and Pinions, Headlights, Replacement Parts for Mine Locomotives, Cutting Machines and Pumps, Bronze and Aluminum Castings.

WE DISTRIBUTE: American Steel & Wire Rail Bonds, Wire Rope and Cable, Great Western Fuses, General Electric Motors and Locomotive Parts, Ball Bearings—New and Reground, Westinghouse Line Material, Gates Rubber Products, "Canton" Splicers and Electric Materials Controller Parts, Lincoln Electric Co. Welders, Parts and Electrodes—all carried in substantial stock for immediate shipment.

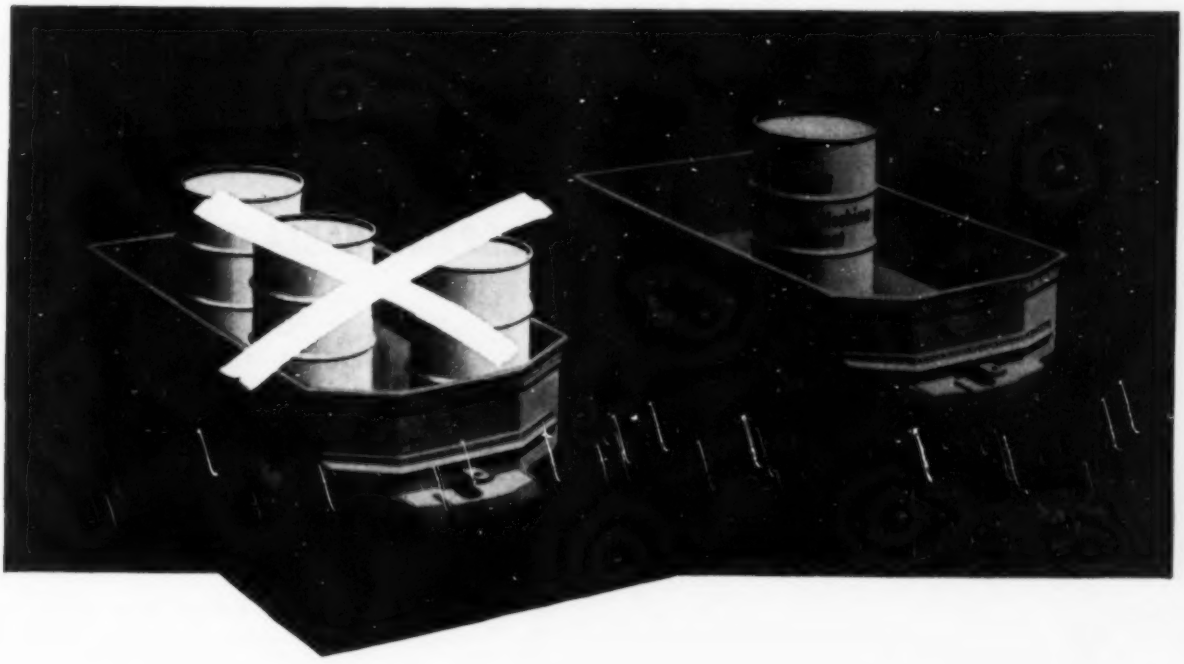
FLOOD CITY BRASS & ELECTRIC CO.

MESSENGER & ELDER STS.
JOHNSTOWN, PA.

Be Sure to Visit our BOOTH 817 at the Coal Show

BRANCH OFFICE:
4 VIRGINIA ST. W
CHARLESTON, W. VA.

Why handle more?



Gulf Mining Machine Lubricant

does the job of 2 or 3 other lubricants

—and does it better!

Here's effective help in your efforts to reduce maintenance costs and simplify lubricant storage and handling—from oil house to face! When you use Gulf Mining Lubricant you can eliminate from 2 to 3 other lubricants depending on the type of equipment you operate. This means less confusion at the face, elimination of application mistakes, better lubrication.

At the same time Gulf Mining Machine Lubricant provides better protection for underground cutting and loading equipment. And it is equally effective for plain and antifriction bearings and for gears in drives and transmissions.

To get the many benefits possible with this quality product, and for expert help on other phases of improved lubrication, call in a Gulf Sales Engineer. Write, wire, or phone your nearest Gulf office today.

Gulf Oil Corporation · Gulf Refining Company

GULF BUILDING, PITTSBURGH, PA.

GULF INDUSTRIAL LUBRICATION

"CONTINUOUS" HAULAGE

FOR CONTINUOUS MINING

ENTERPRISE HAULAGE EQUIPMENT

MINE CARS (4-Axle Cars, Thru-Axle Cars, 8-Wheel Cars)

- End Dump Cars
- Side Dump Cars
- Bottom Dump Cars
- Rotary Dump Cars

EQUIPMENT HANDLING CARS

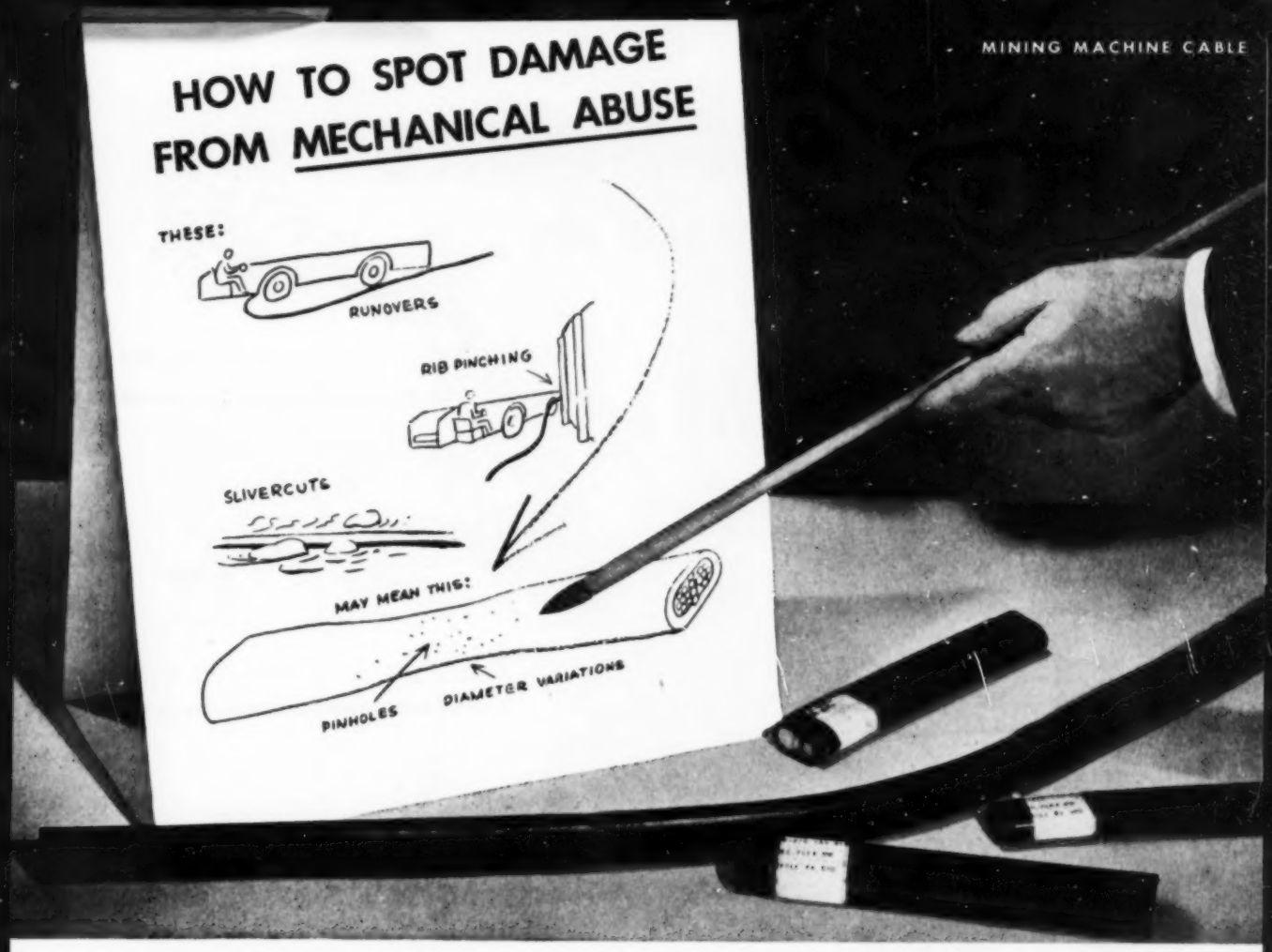
MAN-TRIP CARS

"Your cars custom-engineered for your Specific needs"

AT THE CLEVELAND SHOW . . . . . "See Something New at Booth 1622"

ENTERPRISE WHEEL & CAR CORPORATION

BRISTOL, VA.-TENN. • HUNTINGTON, W. VA.



...AND WHY THERE'S 3 TIMES MORE TOUGHNESS IN ANACONDA'S NEW MINING MACHINE CABLE

Your naked eye can't spot diameter differences in new cables. That's why it's important to check promptly when you *do* see variations in cable after it's been used. It has probably been crushed... by runovers or rib-pinching. Compression cuts may let in moisture *to shorten cable life.*

HOW TOUGH SHOULD CABLE BE?

As tough as we can make it—regardless of cost. One break in a cheap cable costs more than you can save by buying on price alone. The new ANACONDA Cables mean lower costs to you because they can take 3 times more abuse. In fifteen mines recently surveyed, the average life of ANACONDA Cables on shuttle cars jumped 300% over cables used only a few years ago.

WHY THE NEW ANACONDA CABLES LAST LONGER

A stronger jacket, made from a new neoprene compound, resists heat, flame and moisture better. In wet mines, sliver-cuts that may cause shocks are less likely to occur. A new cold-rubber insulation means new toughness. Moisture-wise and puncture-wise both. A new type of stranding improves the flexibility of these cables under stress.

YOU BE THE JUDGE

Examine an ANACONDA Cable. See why these things are so. Call your nearest Anaconda Sales Office or Distributor for a sample. And remember: no ANACONDA Cable has ever failed a U. S. Bureau of Mines flame-test. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

83301

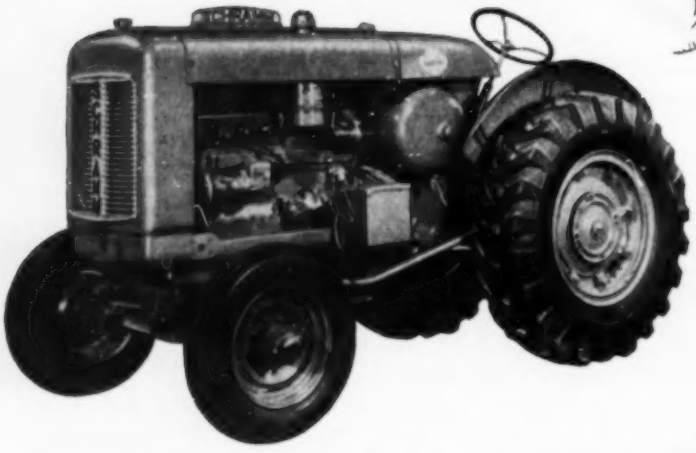
ANACONDA®

TODAY'S HEADQUARTERS FOR MINE CABLE

SAVE MAN-HOURS

while doing these important mine jobs with the

SCHRAMM Pneumatractor



To do the many maintenance jobs about your mines, and to do them at a saving in man power, your one direct answer is the Schramm *Pneumatractor.*

The *Pneumatractor* is a self-propelled air compressor packed with far advanced features. It will *Push-Pull-Power* anything a wheel tractor will—*plus* provide air! Its uses are far greater than the jobs illustrated at the right.

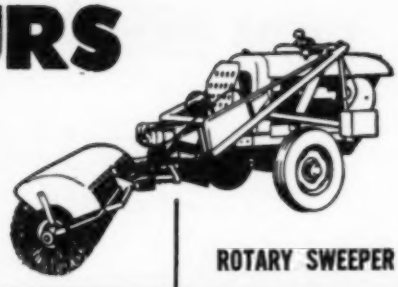
A complete line of SCHRAMM auxiliary equipment is available . . . approved equipment enabling you to do your job better.

For complete details write today for Bulletin NEU-53.

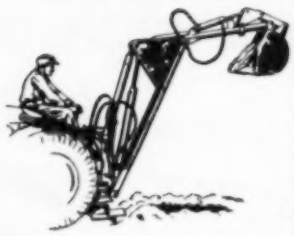
SCHRAMM INC.

The Compressor People

WEST CHESTER, PENNSYLVANIA



ROTARY SWEEPER



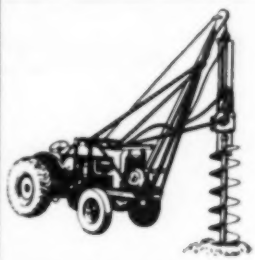
BACK HOE

SPRAY PAINTING

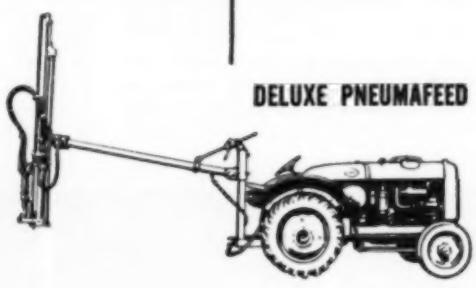
ROCK DRILLING

PNEUMAJACK

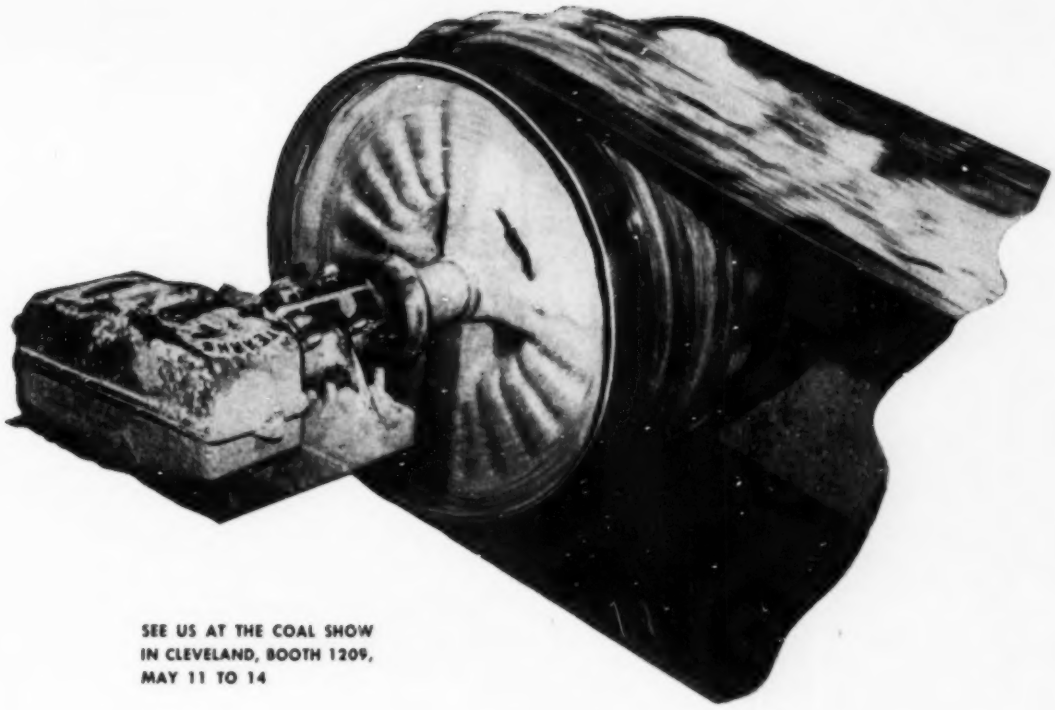
FRONT END LOADER (Hydraulic Dump)



EARTH AUGER



DELUXE PNEUMAFEED



SEE US AT THE COAL SHOW
IN CLEVELAND, BOOTH 1209,
MAY 11 TO 14

Stop That Tramp Iron!

with STEARNS ELECTRO-MAGNETIC PULLEYS

A Stearns Electro-Magnetic Pulley protects your crushing equipment by removing all tramp iron automatically — economically. Reduce shut-down time and keep your repair charges LOW — install a Stearns Electro-Magnetic Pulley. It is the only economical and effective insurance against the tramp iron hazard.

Whether your problem is the removal of tramp iron or the concentration and beneficiation of complex ores, Stearns has EXPERIENCED ENGINEERED equipment to meet your specifications.

STEARNS
Permanent-Magnetic Pulley

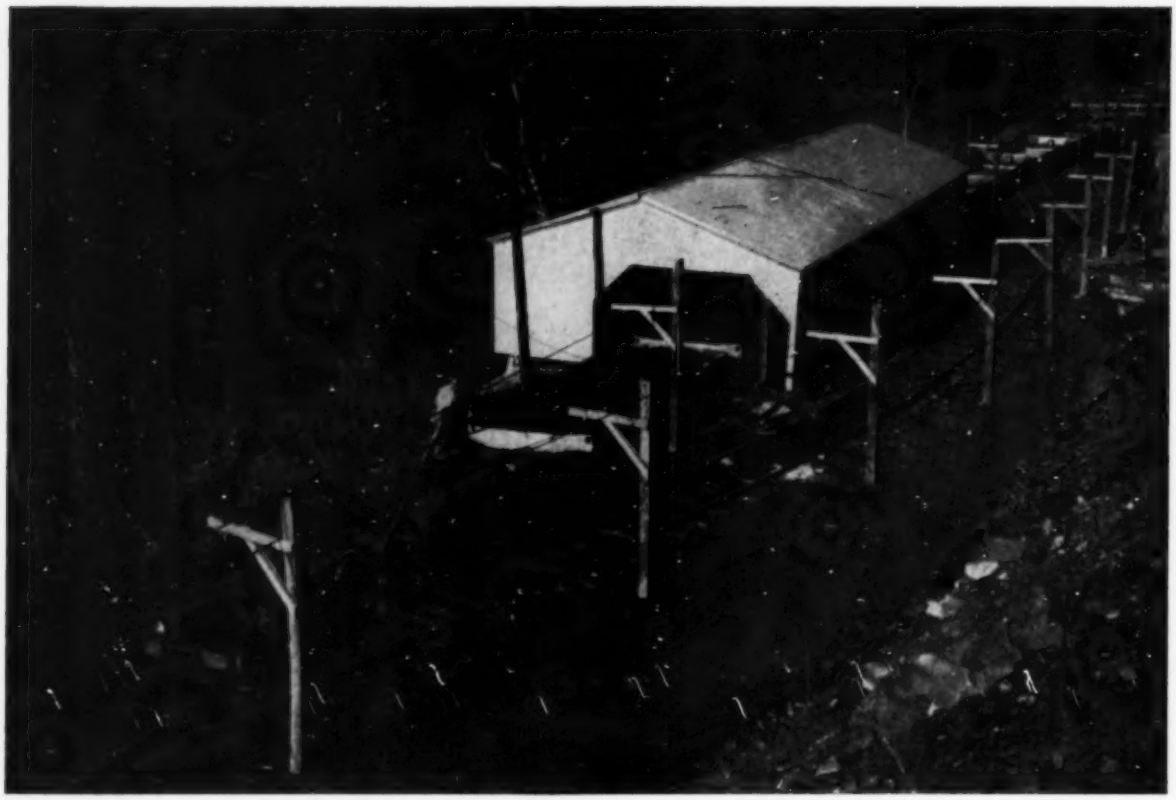
For a thorough investigation of your separation problem, Stearns offers complete laboratory research facilities. Write today for details on testing of sample material.

STEARNS
Suspended Rectangular
Separation Magnet.

MAGNETIC EQUIPMENT FOR ALL INDUSTRY 1006

STEARNS MAGNETS

STEARNS MAGNETIC, INC.
661 South 28th Street, Milwaukee 46, Wis.



Week-End Installation

No Track Sweeper Needed . . .

The smooth riding, low height (27") Differential Mine car SPILLS NO COAL ALONG THE TRACK. The popular, exclusive **axless truck** and solid body carry the answer. Easy riding, smooth-running, lower maintenance and greater capacity **per pound of empty car weight** . . . these make an unbeatable combination.

Details are yours for the asking

Other Differential Products: Locomotives, Mine Supply Cars, Rock Larries, Mantrip Cars, Rotary Dumpers and other dumping devices, and Complete Haulage Systems.

The Boss Man was Skeptical . . .

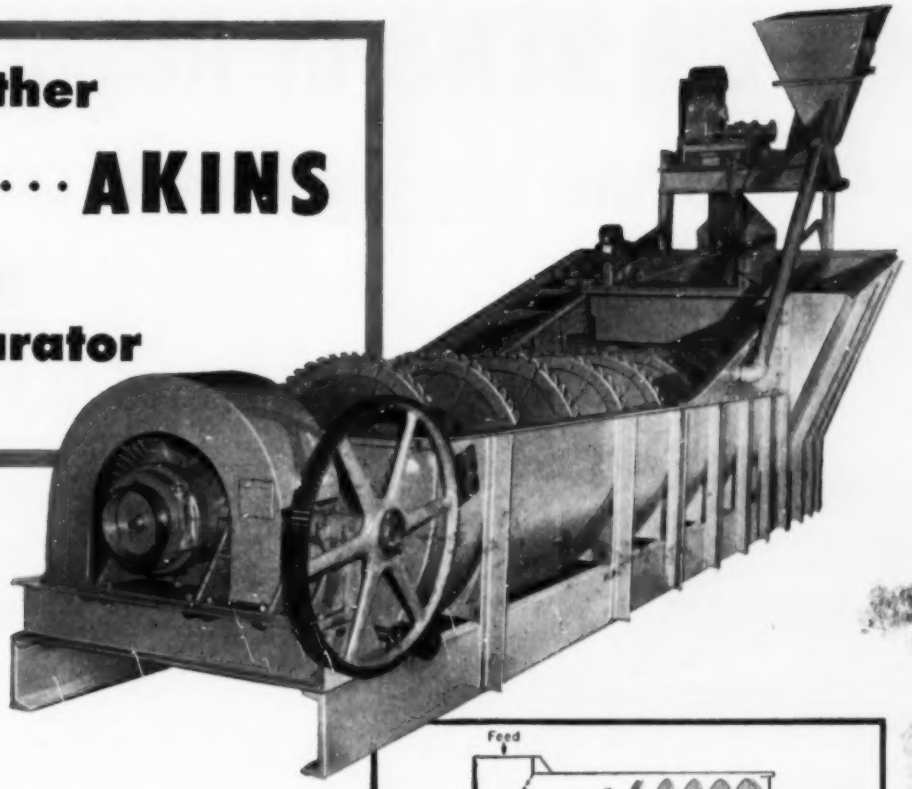
Install a rotary dumper without loss of production time? Practically unheard of! Yet at the Jane Ann #4 Mine at Man, near Logan, W. Va., this Differential Rotary dumper was installed between quitting time on Friday and the usual starting time Monday. The dumper tops a vertical shaft which empties into a hopper 90 feet below.

This modern, speedy (5-second cycle) dumper replaced 4 full-time men stationed at the old cross-over-type dumper. The new one is operated by the trip-rider, WHICH MEANS **NO EXTRA MANPOWER** TO OPERATE DUMPER. A 12-car trip is DUMPED IN 5 MINUTES. EACH CAR AVERAGES 9.0 TONS. (It takes no longer to dump cars twice that size.)

DIFFERENTIAL
STEEL CAR COMPANY
FINDLAY, OHIO

SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT

another ..... AKINS coal separator



3-product separation in single step

Actual commercial installations, beginning in 1948, have proved the performance of Akins HMS Separators. They have illustrated the flexibility of the Akins and the economies that are possible when middling particles are rejected from sink and float constituents of a crude feed.

The Akins requires just one medium circuit. Results—lower initial plant cost and simplified operation with only one point of gravity control.

Our engineers will welcome the opportunity of discussing Akins HMS as related to your particular problems...either in improving existing operations or designing new plants.

WRITE FOR HMS BULLETIN NO. 49

Akins — the ORIGINAL spiral-type classifier

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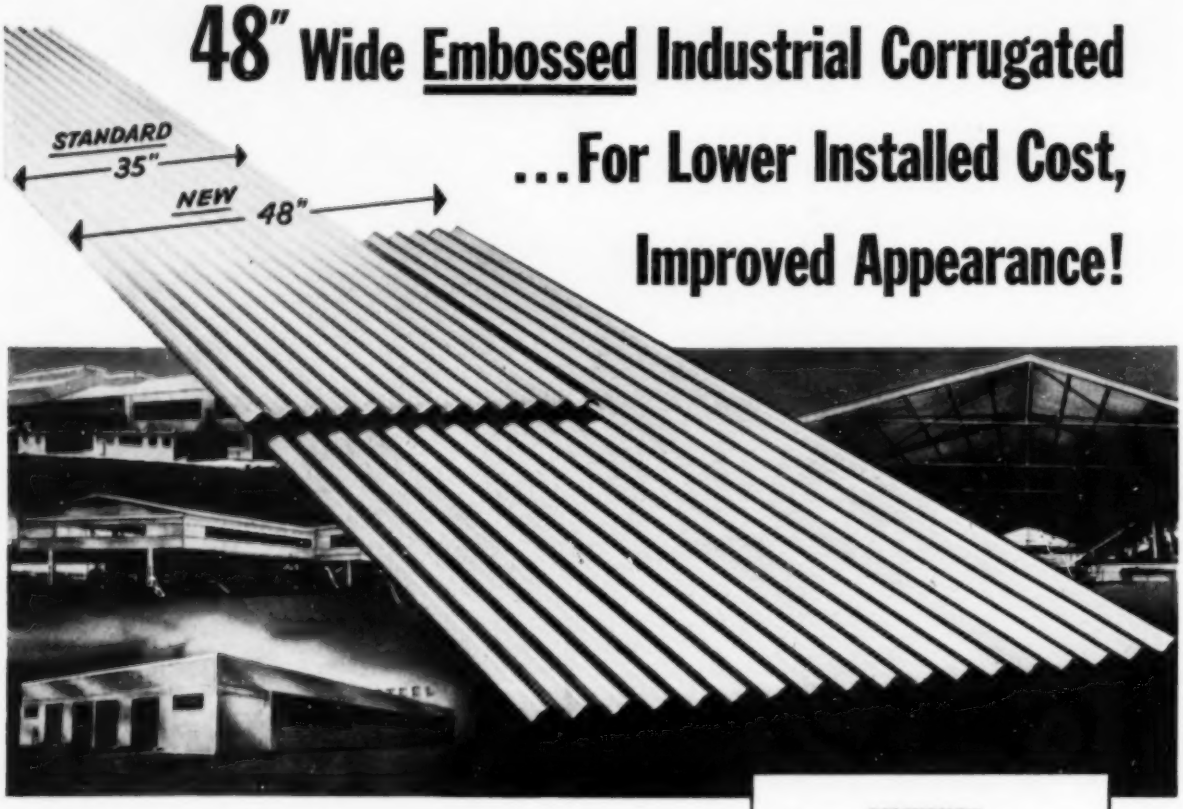
48" Wide Embossed Industrial Corrugated ...For Lower Installed Cost, Improved Appearance!



All the advantages that have made Reynolds Aluminum Industrial Corrugated a sweeping success throughout industry... rust-proof permanence, lowest maintenance, high insulation... now at even lower installed cost and with improved appearance! With these new 48" sheets, side laps take 30% less metal, 30% fewer fasteners... and there are 30% fewer sheets to handle. With the new stipple-embossed finish, the wider-spaced laps tend to disappear... making a handsome, uniform, textured effect. Call on Reynolds for literature, technical and application details.

Offices in principal cities. Check your classified phone book for our listing under "Building Materials." Or write Reynolds Metals Company, Building Products Division, 2041 South Ninth St., Louisville 1, Kentucky.

DESCRIPTION:

METAL THICKNESS: 0.032 inch (22 U.S. Std. Ga.)

FINISH: Embossed.

LENGTHS: 5', 5' 6", 6', 6' 6", 7', 7' 6", 8', 8' 6", 9', 9' 6", 10', 10' 6", 11', 11' 6", 12'. (Special lengths cut to order subject to inquiry.)

WIDTH: Over all width 48½", nominal coverage 45½", 1½ corrugations side lap.

CORRUGATION: Pitch 2.667" center to center, depth ⅞", 18 crowns, 18 valleys, one edge up, opposite edge down.

WEIGHT: 56 pounds per 100 square feet of formed sheet.

Standard .032" mill finish Industrial Corrugated also available—35" width, same lengths as above.

REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

SEE "Mister Peepers," starring Wally Cox, Sundays, NBC Television Network. **HEAR "Fibber McGee and Molly,"** Tuesdays, NBC Radio Network.

Illustrates application of "RUFLOK" by means of a spary gun.

Use "RUFLOK"

(Approved by Penna. Dept. of Mines)

For sealing mine roofs against scaling and spalling during the hot summer months and for many other uses.

1. "RUFLOK" is an especially prepared coating developed by Joseph Woodwell Company that seals roofs against scaling and spalling.
2. It is prepared for application by means of air spray equipment.
3. For over two years actual application in various mines has proved it to be the most effective and economical product of its kind costing but a few cents per square foot including material and labor.

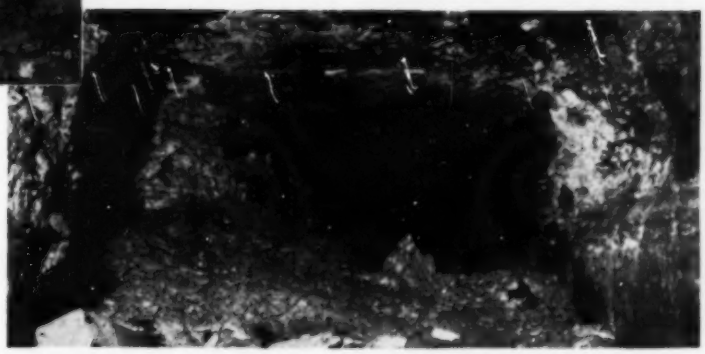
WE SHALL BE GLAD TO SEND YOU A LIST OF MINES WHO HAVE HAD THIS PRODUCT IN USE FOR OVER TWO YEARS.

"RUFLOK" is ideally suited to the following applications:

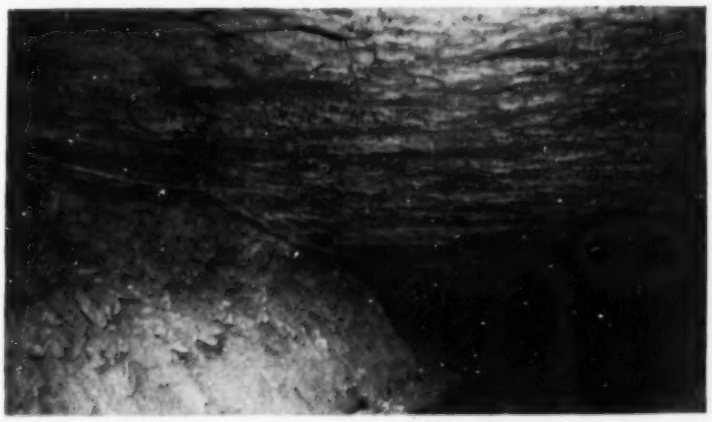
- To seal mine roofs to prevent spalling of rock and slate.
- To prevent crumbling of ribs along haulage-ways where grading has been done.
- To seal cement block stoppings and overcasts.
- To seal temporary brattice cloth stoppings and airways.

"RUFLOK" can be used on cement block, brick, rock, steel and wood surfaces—does not require a primer coat—will not burn or have injurious effect upon a person's skin and has no injurious or toxic fumes.

One of our engineers will gladly call and show you the many advantages of using "RUFLOK" as a protective coating and comparative economy of application.



Shows parallel entry not sprayed with "RUFLOK". Note amount of fallen rock.



Shows condition of main entry after 16 months service when sprayed with "RUFLOK".

LET'S TELL YOU MORE ABOUT RUFKOTE AT THE COAL SHOW — WE'RE IN BOOTH 835

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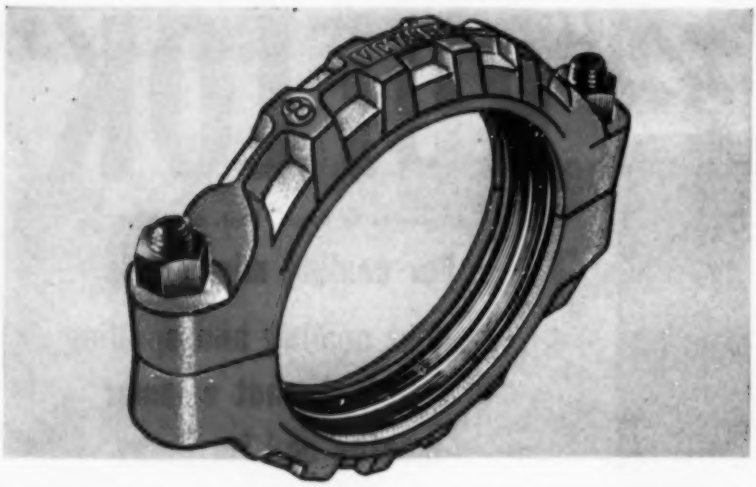
201 WOOD STREET • • • PITTSBURGH 22, PA.



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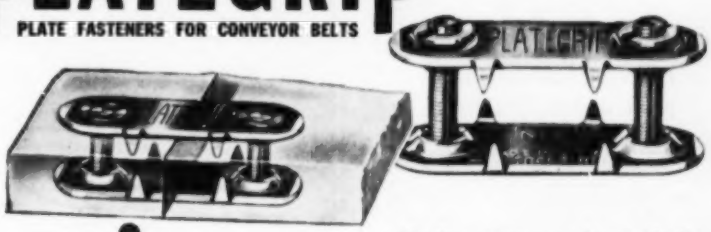

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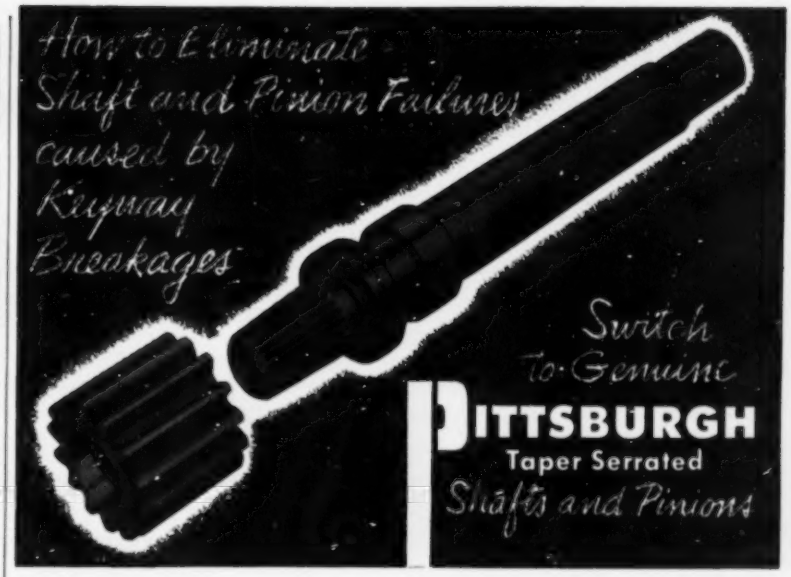
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The Spruce River Coal Company

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Pond Creek Pocahontas Company
The Youngstown Sheet and Tube Co.
Clayton Coal Company
Seanor Mining Company
Pittsburgh Coal Company
Boone County Coal Corporation
Susquehanna Collieries Co.
Enterprise Coal Mining Co., Inc.
Johnstown Coal and Coke Company
Lake Superior Coal Company
Dawson Collieries

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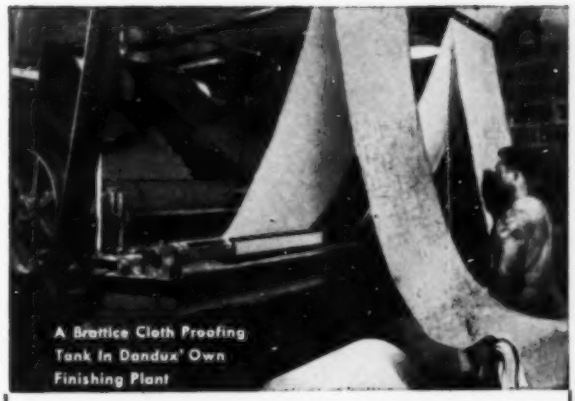

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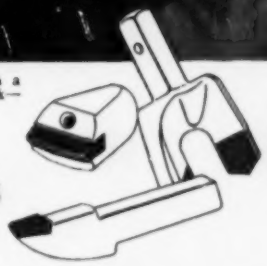

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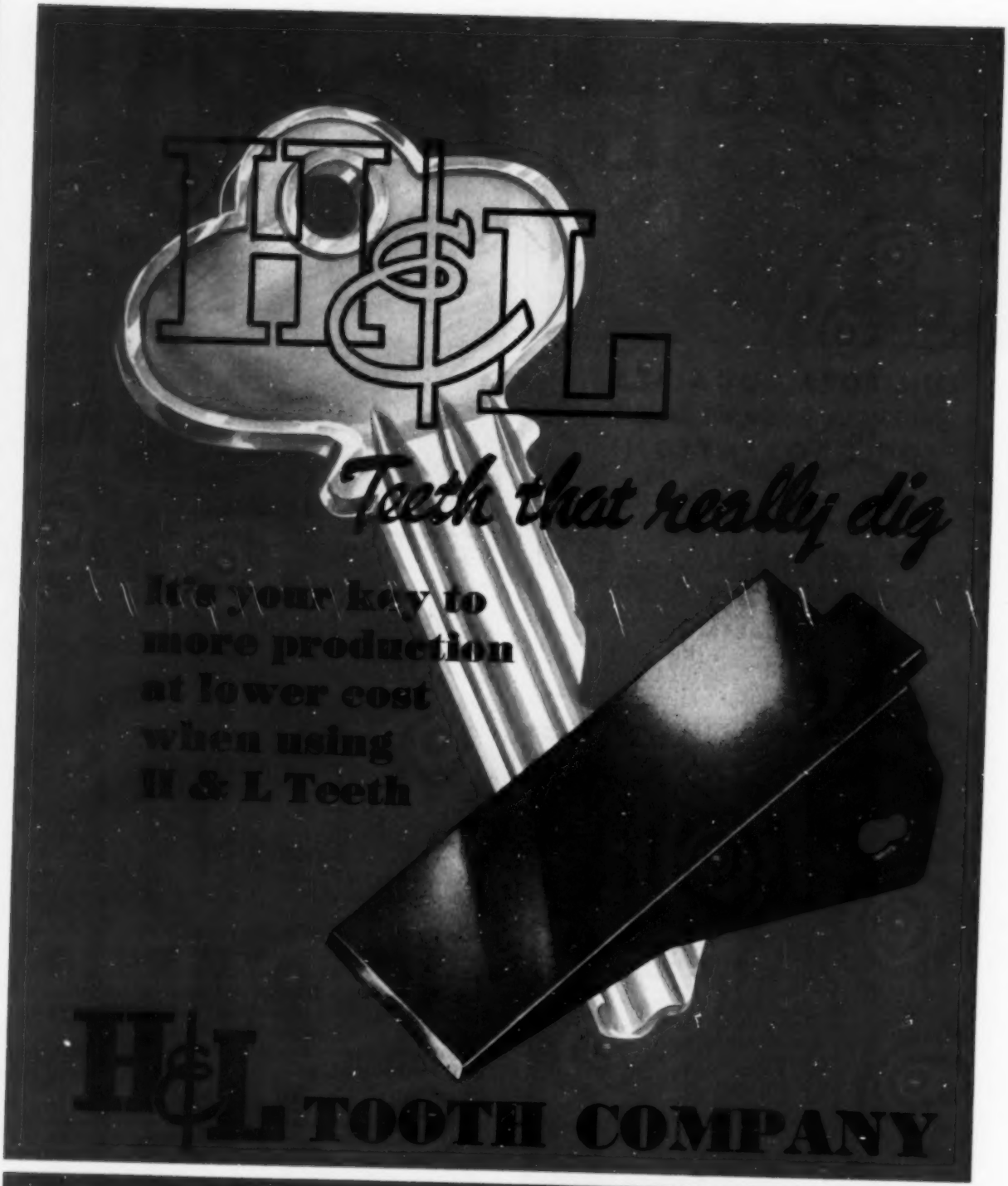

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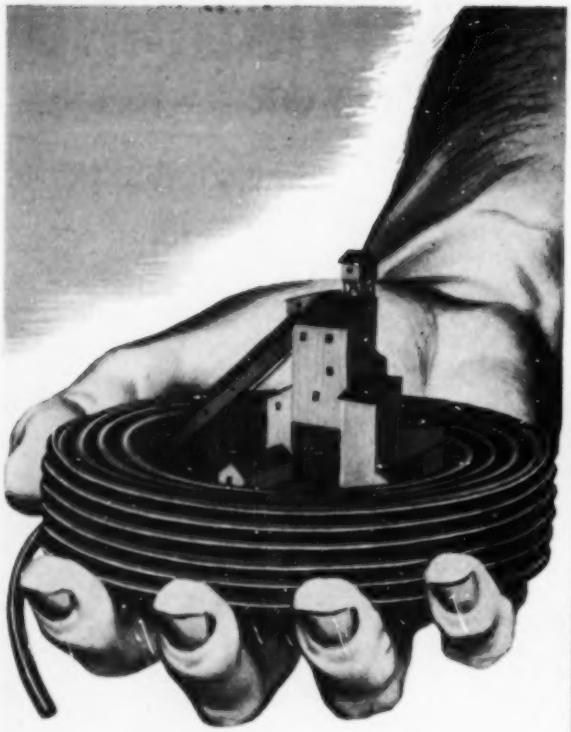

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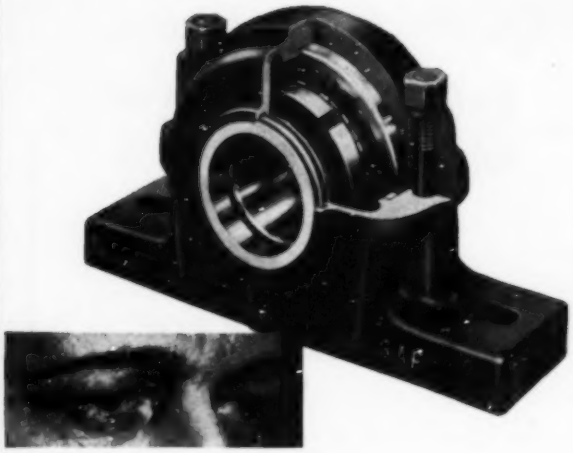

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Do these things at the Mining Congress Show, May 11-14, in Cleveland, Booth No. 830. **SKF INDUSTRIES, INC.,** PHILADELPHIA 32, PA.—*manufacturers of* **SKF** *and* HESS-BRIGHT *bearings.* 7427

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GASOLINE • STEAM • ELECTRIC DRILLS
WE PRE-GROUT SHAFT LOCATIONS
HORIZONTAL DRILL HOLES FROM 3" TO 16" FOR DEWATERING MINES
OUR OPERATORS ARE HIGHLY SKILLED

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Exploration for coal and other mineral deposits.
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Approved by the Pa. Dep't. of Mines, these rigid non-conductive explosive boxes represent a prime safety investment. Made entirely of wood—tongue-grooved and dovetailed construction . . . no metal parts. . .automatic lock. . .rubber band spring . . . moisture-resistant. Box sizes are based on 1¼" x 8" sticks.

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No. 9	$2.55 ea.	No. 25	$5.10 ea.
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No. 6, size 2½" x 3" x 6" inside...$2.15 ea.
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For Tamping Explosive Shots: Poles are round, made of Hardwood. Sizes to 18' long. Price per lineal ft.: 1" dia. 8c; 1⅛" dia. 12c; 1¼" dia. 14c; 1⅜" dia. 18c; 1½" dia. 18c; 1¾" dia. 28c; 2" dia. 32c. Special diameters and lengths can be furnished. These Poles meet the requirements of the New Federal Mine Safety Code.

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These poles are made of straight grained wood and are coupled together with removable wood pins held in place in recessed grooves by a rubber band and can be quickly connected and unconnected.
Couplers and Head Blocks are 4, 5 and 6 inches in diameter. Please specify size when ordering. Poles are 1½" in diameter.
Head Blocks, $3.70 ea.; Couplers, $3.90 ea.; Poles 12 feet long, $3.80 ea.; Poles 14 feet long, $4.20 ea.; Poles 16 feet long, $4.80 ea.; Poles 18 feet long, $5.30 ea.; Poles 20 feet long, $7.00 ea.; Poles 22 feet long, $8.80 ea.; Poles 24 feet long, $9.80 ea.

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We also manufacture Shot Firing Units, Wooden Mallet and Wedge Sets, Trolley Poles, Sounding Sticks, Mine Rollers, Insulation Blocks and Brake Blocks

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PIPE-COUPLINGS—FITTINGS
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by one unskilled man. 2½ to 30 o. d. black or galvanized. Ready to lay—without delay.

Complete inventory of all Industrial Pipe, Valves, Fittings, and Flanges.

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Save Trip Time on Main Haulage
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A two wire cable connects two or more signals together into one block. Only one signal can show proceed on the entrance of a trip, all other signals show stop.

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"Cheatham Switch" TRACK POINT SHIFTER ELECTRICALLY OPERATED

Thrown by Motorman • Saves Time and Money

This modern track switch is thrown swiftly and safely by motormen as they sit in their cabs. It saves time and money, and is fool-proof and dependable!

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ELECTRIC TRACK SWITCHES

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after you've read this magazine

. . . and clipped pertinent ideas, articles and advertisements for reference, *please do not burn or throw it away.*
Here are two sound reasons why:

1) Wastepaper can help to swell the funds of your local Boy Scout Troop, your church or other community organization. It gets a good price these days.

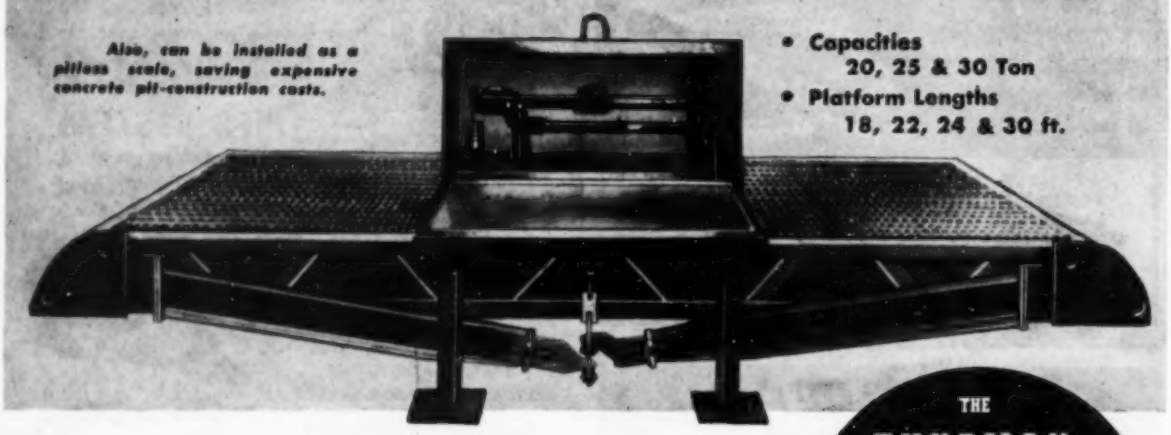
2) Whether in magazine form or not, wastepaper helps to fill the increasing need for paper pulp brought on by the mobilization effort.

Collect it. Give it to your favorite organization. Chances are they have scheduled pickups.

THIS SCALE CAN BE MOVED FROM JOB TO JOB, AS A UNIT

Also, can be installed as a pitless scale, saving expensive concrete pit-construction costs.

- **Capacities**
  20, 25 & 30 Ton
- **Platform Lengths**
  18, 22, 24 & 30 ft.



THE THURMAN PORTABLE TRUCK SCALE

ACCURATE and PORTABLE

This scale can be transported, assembled, from one job to another by removing six bolts which hold the side levers in place. The complete scale can then be lifted as a unit and loaded onto a truck as a unit. It can be readied for use in minutes.

WIDE STEEL BASES

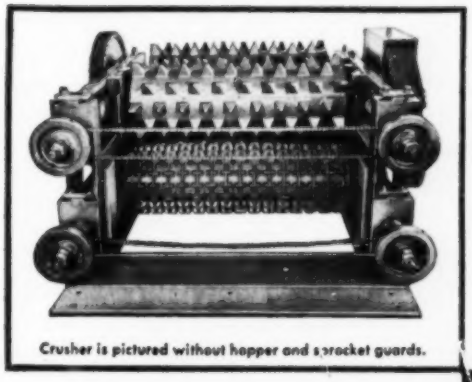
This scale requires no concrete footing. The steel bases at both ends support the scale perfectly. The easy-to-read weighbeam is chrome-plated. Other vital parts are electroplated against corrosion. Write for additional information and prices.

Other Thurman weighing equipment: Pit Scales—Pitless Scales—Wheelbarrow scales—Warehouse scales, to fit your requirements

Est. 1918

THURMAN MACHINE CO. SCALE DIVISION 156 North Fifth Street Columbus, Ohio Dept. B

At the Coal Show . . . SEE Two Stage Crushing in One Machine



Crusher is pictured without hopper and sprocket guards.

The GUNDLACH *"Two Stage"* Coal Crusher on display at the 1953 Coal Show incorporates two crushing stages in one machine and is designed to reduce RUN-OF-MINE to STOKER COAL in ONE operation. Compact design simplifies structural supports and installation. Rugged simple construction combined with engineering proved in the field makes this machine a profitable and reliable unit.

All Gundlach Crushers are equipped with Gundlach Patented Crushing rollers. (Pat. No. 2578540)

VISIT BOOTH 2104
UPPER LAKESIDE HALL

T. J. GUNDLACH MACHINE COMPANY
BELLEVILLE, ILLINOIS

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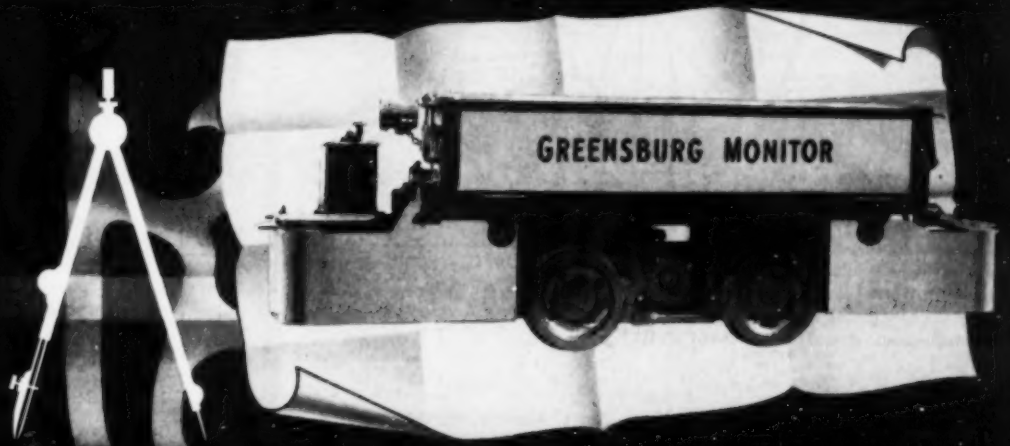
designed to Outpull, Outperform and Outlast . . .



This 6½ ton **Monitor** is designed to outpull, outperform and outlast any comparable storage battery locomotive of equal weight and battery capacity. More tractive effort, better riding qualities and longer battery life are assured by our double equalizers which exert equal pressure on all 4 wheels. Custom built to your requirements in single or double motor drive with drum, cam or contactor type controller.

GREENSBURG MACHINE COMPANY
101 STANTON ST., GREENSBURG, PA.

The difference between Life... and Death...

"Why should you give blood? Ask me—I ought to know. I fought in Korea. But since then I've been through the biggest battle of all—the battle for life itself. And it was blood—and blood alone—that saved me. Don't know when I'll be in a position to start repaying my debt by giving some blood of my own. But I will—some day. You can count on it!"

All kinds of people give blood—for all kinds of reasons. But every reason for giving blood is a *special* reason . . . just as every American life that can be saved at any time and at any place . . . is special. So whatever *your* reason for giving blood, this you can be sure of: Whether it goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

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POSITION WANTED & INDIVIDUAL SELLING OPPORTUNITY wanted undisplayed advertising rate is one-half of the above rate, payable in advance.
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BOX NUMBERS care of publication count as 1 line additional.
DISCOUNT OF 10% if full payment is made in advance of four consecutive insertions of undisplayed ads (not including proposals).
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The advertising rate is $9.25 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured ⅛ inch vertically on one column, 3 columns—30 inches—to a page. C.A

NEW ADVERTISEMENTS: Address N.Y. office, 330 W. 42 St., N.Y. 36, for June issue. Closing May 20th.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

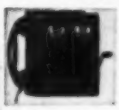
SELLING OPPORTUNITY OFFERED

MECHANICAL PACKINGS—Manufacturer of unusual line of extraordinarily successful on mining installations wants aggressive representation in coal areas. Must be currently calling on mines. No objection to non-competitive complementary lines. Liberal commission basis. RW-7518, Coal Age.

WANTED

ANYTHING within reason that is wanted in the field served by Engineering Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

2 TELEPHONES $25.95



Inter-communication handsets, two wire system. Included Two 3 volt batteries, 50 ft. of wire and simple wiring instructions. Additional wire 1 cent per ft. or $25.00 per mile. Complete list of telephone parts, handsets, magneto—common battery—and dial telephones, switchboards, etc. Write:
Telephone Engineering Co., Dept. 11, Simpson, Pa.

FOR SALE
1—Pomona Bolted Head Water Lubricated Deep Well Turbine Pump. Capacity 750-800 GPM against 350 ft. total head.
1—Peerless Vertical Motor Oil Lubricated Deep Well Turbine Pump. Capacity 1000 GPM against 350 ft. total head.
Both pumps in good condition.
Bargain. Liquidating Property
Bernice Anthracite Coal Co.
Russellville, Arkansas.

PORTABLE BATTERY CHARGER
G. E. Copper Oxide Charger for railway car batteries. Input 3/60/220V, output cap. up to 200 amps for 16 lead or 25 Edison cells. Up to 100 amps for 32 lead or 50 Edison cells, weight 1200 lbs, 4 solid rubber tired wheels, MOD #6RC11OF9.
CARELL MACHINERY COMPANY
503 McCarter Highway, Newark, N.J. Market 4-4848

IF THERE IS

Anything you want

that other readers of this paper can supply

OR—

Something you

don't want

that other readers can use, advertise it in the

Searchlight Section

FOR SALE
1—24 x 30 Erie ball engine directly connected to Westinghouse 300 K.W. 250 Volt. 1200 Amp. 150 R.P.M. Interpole compound wound direct current generator.
1—Ideal 18" x 19" Horizontal slide valve engine directly connected to 125 K.W. Triumph direct current generator 225-235 Volt. 532 Amp. 200 R.P.M.
1—Allis Chalmers Synchronous Converter, D.C. Volts No. Load 250 Full load 250 Amp. 1200 A.C. Volts 185 Amp. 600 PH. 6 Cycles 60 R.P.M. 1200.
With transformer and switch panel.
ALSO Misc. sizes of 220 Volt D.C. motors starting boxes and switch.
Yours truly,
The Nivison-Weiskopf Company
Reading 15, Ohio

FOR SALE — MINE CARS
120—Watt steel mine cars with wood bottoms, rotary dump type, 44 in. track gauge, 3½ to 4 ton capacity, overall length 11 ft. 10 in., 42 in. height above rail, 72 in. wide, 14 in. dia. Timken bearing wheels—in very good condition.
The Valley Camp Coal Co.
Maiden Mine, Maidsville, W. Va.
Telephone: Mt. Morris, W. Va. 25

WANTED

Complete equipment from small mine going out of business including locomotive, cars, loader, fan, drills, etc. All necessary equipment to operate new small mine now being developed. State location, accessibility, condition and lowest cash price first letter. Write airmail to

Cripple Creek Coal Co.
P.O. Box 622
Fairbanks, Alaska

WANTED

Bucyrus Monighan, or equal, all electric Walking dragline, 10 yd. to 15 yd. size, 175' boom or longer, with bucket, 2300/4000 volts a.c., good condition. Write —
H. Y. SMITH CO.
828 N. Broadway Milwaukee 2, Wisc.

WANTED
HOISTS
NEED two large 2-drum mine shaft hoists with electrical equipment. Write
W 6900 Coal Age
330 W. 42nd St., New York 36, N.Y.

BUYERS OF SURPLUS COPPER INSULATED WIRES AND CABLES
No lengths too long or too short
Telephone: Eastgate 7-4778
PIERCE CABLE CO.
2664 Clybourn Ave. Chicago 14, Illinois

SPECIALS
112AA (several) Universal Goodman Cutting Machines, etc.

SUBSTATIONS
Rotary Converters
150, 200, 300 & 500 Kw — 275 VDC
300, 500, 750 Kw — 600 VDC
Selenium Rectifiers
50 Kw, 100 Kw, 150, 200 & 300 Kw
Mercury Arc Rectifiers
250 Kw & 500 Kw
Furnished to buyer's requirements.
Why buy otherwise? . . . Low Prices
R. H. Benney Equipment Co.
3024 Montgomery Road, Norwood 12, Ohio
Cincinnati Phone: MElrose 1108

FOR SALE

3—Model 4500 Manitowoc Draglines, caterpillar-mounted, with 140' booms, buckets, Caterpillar engines, 5 cu. yd. 100-ton capacity, one and two years old.

1—Model 3500 Manitowoc Speedcrane, Liftcrane, clamshell, dragline combination, 2½ cu. yd. 60-ton capacity, new October, 1950.

1—Model 803 Koehring Liftcrane, Clamshell, Dragline combination, 2 cu. yd. 50-ton capacity.

All located in Florida. Reply to
Clemens Construction Company
P. O. Box 266, West New York, N. J.

FOR SALE

1—Jeffrey Aerodyne Exhaust Fan Type 8-H-60, Serial #8636, complete w/ 75 HP Whse Motor and 75 HP Gasoline Engine w/ automatic controls.
1—G.E. Locomotive, 8 Ton, cable reel type, 250 V. DC. 42" Gage, Serial 8929.
2—11BU Joy loading machines, Serial 3650 & 1822.
3—Westinghouse transformers, 150 KVA, 1 Phase 60 cyc. Serial #1210 #1210161.
2—G. E. Transformers #1797341 Type H Form K, 60 cyc. 25 KVA.
1—Lot of 2" and 3" Aultman pumps.
1—29U Jeffrey Cutting machine track mtd., good condition.

FARLAND FUEL COMPANY
Rt. #1, Shinnston, W. Va.

Ironton Electric Locomotives
New and used.
The Ironton Engine Company
Farmingdale, New Jersey

FOR SAFETY
NEW CROUSE HINDS
EXPLOSION PROOF TELEPHONES
Immediate Delivery
At Fraction of Current Cost
$375.00 MODEL ETG-24 @ $100.00
$265.00 MODEL ETB-24 @ $ 80.00
Loud Ringing Bells Included
GENERAL TRADERS, INC.
2675 W. Grand Ave. Chicago, Ill.

SEEING IS BELIEVING

Lowest Prices on the Largest Stock of Most Desirable Used Mining Equipment East of the Mississippi.

CUTTING MACHINES

All types—34 in stock.
Goodman 512EJ, 212AA, 112AA, 12AA.
Joy 11B, 7B—Jeffrey 35L, 35B, 35BB, 29L, 29C.
AC and DC Current.

LOCOMOTIVES

Haulage and Gathering, 45 in stock.
All track gauges.
Jeffrey MH-7B, 10 ton, and tandem 20 ton.
Jeffrey MH-8B, 6 ton. Also tandem 12 ton.
Goodman 6 ton & 8 ton. Westinghouse 4 and 6 ton.
Most of the above have motor driven reels.
4, 16, and 20 ton Gas & Diesel Locomotives.

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Nine Available of all types.
Joy 14 BU, 12BU, 11BU, 8BU, 7BU.
Jeffrey 61 CLR, like new, on rubber, 24" high. Myers Whaley No. 3 and No. 4. Goodman 660.

CONVEYORS

22 units in stock.
Jeffrey 61 AM 12" Room Conveyors.
Jeffrey 61 HG Face Conveyors.
Joy 12" and 15" Conveyors.
Goodman 30" x 600' Belt Conveyors.
Goodman G-15 Duck-Bill Units.
Joy UH-17 Shaker Conveyors.
Barber-Greene 24" x 45' Portable Belt Conveyors.

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6 In Stock. 200, 150 and 100 KW Rotaries.
150 KW MG Set. 75 and 100 KW Diesel Plants. All 250 Volt DC.

MINE CARS

600 Available. 42", 44" and 48" Ga.
Drop Bottom and End Dump.

TRANSFORMERS

125 in stock. Most sizes and voltages.

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Crushers, 4 in stock. Vibrators, 3 on hand.
Loading Booms, Feeders. Picking Tables.

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1 MSA Rock Duster, like new.
6 Jeffrey 35BB, 29L Spare Armatures.
6 Class 21 Jeffrey Starters.
7—8000 Gallon Tank Car Tanks.
4000 Five Gallon G.I. Gas & Water Cans.
1 Brown Fayro Car Spotting Hoist.
1 Joy CHD Car Spotter (new)
Relaying Rails, 500 tons, 20, 30, 40, 70 and 80 lbs.
Steel Mine Ties, 42" & 48" Ga. 20#, 30#, 40# and 60#.
Coal Drills, CP-572, AC and DC.
New Alemite portable Greasing Unit.
Incline Hoists. Drill Press. Lathe.
Planers, Shear, Etc. Stationary Motors AC and DC. All sizes.
Spare Armatures of all kinds.
Mine Scales, Pipe Threading Machines.

J. T. FISH & COMPANY

LOGAN, WEST VIRGINIA . . . PHONE — 2825

Thousands of Other Items in Stock. Send us your Inquiries.

CAR DUMPER: Link Belt, will dump standard R.R. gondola cars up to 90 tons capacity, transfer table 54 ft. Specifications and photos available.

LOCOMOTIVE CRANE: Link Belt 25 ton capacity, standard R.R. gauge, gasoline powered, cast steel trucks, air brakes, with or without 1½ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota.

DIESEL MOTOR: 122 H.P. Caterpillar D13000, complete with clutch, V-belt pulley.

WEMCO SINK FLOAT MOBILE MILL, used only 6 months, capacity 30 tons per hour.

CLASSIFIERS: Akins and Wemco 54" x 34" with motors. NEW condition.

A. J. O'NEILL

Lansdowne, Pa.

Phila. Phones: MAdison 3-8300 — 3-8301

WIRE ROPE *FOR SALE*

2—1,250 Ft. Pcs. 1-⅜" Roebling Locked Smooth Coil Track Strand Wire Rope for Aerial Tramway. NEW—NEVER USED. Apply to THE SNAP CREEK COAL COMPANY, P.O. Box No. 1029, or Tel. 1533, Logan, West Virginia.

FOR SALE

New 500 Gal. Skid Mounted STORAGE TANKS

Shell of ⅛" Steel, 2" Outlet and 12" Manhole in Top.

LEFTON INDUSTRIAL CORP.
212 Victor Street, St. Louis (4) Mo.

SPECIAL OFFERING

New 200 KW RECTIFIER UNIT

Rating: 200 kw General Electric sealed Ignitron Mercury-Arc Rectifier, fully automatic, specially adapted mining service; 275 volt DC; 4000/2300 volt AC; 3 phase, 60 cycle.

STEPHEN HALL & CO., INC.
7th & Adams Sts., Hoboken, N. J.

FOR SALE
ALL GOOD CONDITION LOW PRICES

4—908 Westinghouse 13 ton Haulage Locomotives
2—905 Westinghouse 8 ton Haulage Locomotives
5—902 Westinghouse 4 ton Gathering Locomotives
1—MH-100 Jeffrey 8 ton Haulage Locomotive
4—MH-88 Jeffrey 6 ton Gathering Locomotives
2—33 Goodman 6 ton Gathering Locomotives
22—CE-7 Sullivan Shortwall Machines
7—112 Goodman Shortwall Machines
700—Watt Steel and Wood End Dump Mine Cars
22—C.P. #473 Post-mounted Coal Drills
23—G12-½ Goodman Shaker conveyors with panline
5—Brown Fayro HKL Car Spotting Hoists
2—Brown Fayro HGD Hoists
2—M.S.A. Type S Track-mounted Hi-Pressure Rock Dusters
2—American Mine Door Midget Rock Dusters
1—Sullivan WL-70 Air Compressor, track mounted
3—Type E1G16 Goodman Duckbill Units
8—Irwin all steel 8-wheel mantrip cars
3—Joy 8BU Loaders

THE VALLEY CAMP COAL CO.
P. O. BOX 2008
ELM GROVE, W. VA.
TELEPHONE — TRIADELPHIA, W. VA. 2010

FOR SALE

2—8BU Joy Loaders, 250 Volts. Rebuilt.
1—12BU Joy Loader, 250 Volts. Good Condition.
1—150 KW West. Rotary Converter, 2300-275 V.
1—100 KW G. E. Sync. M. G. Set, 2300-275 V. Rebuilt.
4—32D Joy Battery Shuttle Cars, with charger.
2—35B or BB Jeffrey Shortwalls, 250 Volt—With or without truck. Rebuilt.
2—7AU Sullivan Universal Track Mounted, 250 V.
1—29U Jeffrey Universal Track Mounted, 250 V.
2—6 ton Jeffrey MH8B Locomotives, any gage.

TIPPINS MACHINERY CO.
1001 Washington Blvd., Pittsburgh 6, Pa.

CARLYLE
INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

IMMEDIATE DELIVERY OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — PIPE, WATER, SUCTION, AIR, STEAM AND SPECIAL HOSE

WHY WAIT

We have 8 to 48

RUBBER CONVEYOR BELTING

TOUGH COVERS—heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly capable of withstanding the abrasive action of bulk materials. Properly vulcanized to the carcass to assure utmost performance, economically.
STRONG CARCASS—Constructed of finest quality 28 and 32 ounce tough cotton duck, properly treated and impregnated to avoid mildew from moisture and atmospheric conditions. Each ply thoroughly embedded in rubber to prevent ply separation.
FLEXIBILITY — Careful attention has been given in the construction of all belts to have the proper flexibility assuring the following desirable features: troughs easily, runs true on all idlers, gouge resistant, excellent for long and short hauls and slope installations.

Avoid delays in your production schedules!

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches

Width	Ply	Thickness Top Cover	Thickness Bottom Cover	Type of Duck Carcass
8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
48"	8	1/8"	1/16"	32 Oz.

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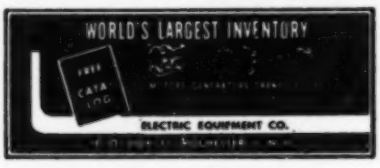

We have recently purchased several complete coal plants and have available an excellent stock of all types of machinery. Below is just a partial listing of our complete stock of mining, electrical and industrial equipment.

LOCOMOTIVES

1—1½ ton Mancha "Trammer", 18" ga.
1—2 ton Whitcomb, battery, 24" ga.
1—4 ton Mancha, battery, 24" ga., with Edison batteries and charging set
1—4 ton Ironton, battery, 36" ga.
2—7 ton G. E. permissible battery, 36" ga.
1—7 ton Atlas, battery, 36" ga.
3—8 ton Ironton, 36" ga.
2—8 ton General Electric, battery 36" ga.
4—10 ton Atlas, battery, 36" ga.
1—3 ton Whitcomb gas engine driven, 24" ga.
1—2½ ton Jeffrey trolley, 36" ga.
1—4½ ton Goodman trolley, 36" ga.
1—5 ton Jeffrey trolley, 36" ga.
1—6 ton Goodman trolley, 36" ga.
2—8 ton Goodman trolley, 36" ga.

COAL CRUSHERS

1—24" x 24" Jeffrey Single Roll
1—24" x 36" McNally-Pittsburg Double Roll
1—30" x 45" Jeffrey Single Roll
1—30" x 16" Williams Pulverizer
1—36" x 40" Jeffrey Double Roll
1—36" x 48" Jeffrey Hammermill

TUGGER & SLUSHER HOISTS

2—5 HP Brownie Room Hoists
3—5 HP Sullivan RH single drum Room Hoists
1—7½ HP Sullivan double drum Slusher Hoist
2—10 HP Sullivan 3 drum Slusher Hoist
1—25 HP Sullivan 2 drum Slusher Hoist
1—Ingersoll-Rand Model 1H Air Tugger Hoist
1—Ingersoll-Rand Mod. 6HC Air Tugger Hoist
1—Ingersoll-Rand Model EU Air Tugger Hoist
2—6½ HP Sullivan Single Drum Air Tugger Hoist, 250 Volt DC
7—6½ HP Sullivan Double Drum Slusher Hoist, 250 Volt DC
1—Double Drum Sullivan Slusher Hoist Driven by Continental Gasoline Engine

ELECTRIC HOISTS

1—11 HP Vulcan #0 single drum
1—20 HP Vulcan single drum
1—22 HP Vulcan double drum
1—25 HP Vulcan single drum
1—30 HP Vulcan single drum
1—37 HP single drum
5—50 HP single drum
2—60 HP single drum
4—100 HP Box single drum
1—112 HP Vulcan single drum
1—145 HP Vulcan single drum
2—150 HP Vulcan single drum
1—375 HP Box single drum
1—600 HP Box single drum

BOX CAR LOADERS

2—Ottumwa 20 HP Box car loaders
3—Maniere 22 HP Box car loaders
1—Jeffrey 20 HP Box car loader

MINING MACHINES

2—7B Sullivan super short wall coal cutters
18—CE7 Sullivan coal cutters
1—CR3 Sullivan coal cutter
1—Jeffrey 28A coal cutter
6—Goodman 112-A coal cutters
1—Sullivan CH-11 ironclad shearing machine
1—Jeffrey 29-C Arcwall coal cutter

LOADERS & CONVEYORS

2—8BU Joy loaders
2—61EW Jeffrey elevating chain conveyors
1—61HG Jeffrey chain conveyor, 90'
1—61W Jeffrey chain conveyor, 200'
9—G-20 Goodman shaker conveyors
10—G-15 Goodman shaker conveyors
8—Vulcan shaker conveyors
2—Joy ladel UN-17 shaker conveyors
10—Goodman HA duckbills

MINE FANS & BLOWERS

2—8-H Jeffrey 42" Aerodyne Fans
1—Jeffrey 8 x 4 Fan
5—Jeffrey A61 exhaust blowers
8—Jeffrey Aerodyne midget blowers

SCALES

3—100 ton Fairbanks railroad scales
1—100 ton Howe railroad scale
1—125 ton Howe railroad scale
1—5000# Fairbanks Tipple scale with weighing basket
1—5000# Howe Tipple scale

STORAGE BINS

3—50 ton capacity steel bins
2—100 ton capacity steel bins

TIPPLE EQUIPMENT

1—4 deck shaker screen 32' long in 2 sections, driven by 10 HP & 25 HP motors
1—4 deck card shaker screen, 18' long, driven by 50 HP motor
1—Card rotary car dumper
1—Bucket Elevator, 36'6" centers, 18" x 11" x 9" buckets.
1—Bucket Elevator, 45' centers, 6"x4" buckets
1—Bucket Elevator, 48'8" centers, 10" x 6" buckets
1—Jeffrey picking table, 19' centers, 36" wide
1—Jeffrey picking table, 19'8", 36" wide
1—Jeffrey Drag Conveyor, 88'6", 36" flights
1—Jeffrey Drag Conveyor, 72', 30" flights
1—Jeffrey Drag Conveyor, 67', 30" flights
1—Jeffrey Drag Conveyor, 69'6", 28" flights
1—Link Belt Drag Conveyor, 50', 15" flights
1—32" x 9'6" Card vibrating screen
1—4' x 6'6" Link Belt jig washer
1—Loading boom, 32'3" centers, 24" flights with 8' grizzly
1—Loading boom, 55' centers, 48" flights
1—Loading boom, 45' centers, 30" flights
2—Card self dumping mine cages
2—Card 84" bicycle sheave wheels
1—24" Belt conveyor, 40' centers
1—24" Belt conveyor, 13' centers
1—24" Belt conveyor, 135' centers
1—24" Belt conveyor, 66' centers
1—30" Belt conveyor, 173' centers
1—Red Devil egg loader, 16" flights
1—Ottumwa nut loader, 16" belt

ELECTRIC CABLE

1368'—#10 Parkway cable 3/c, 7200 volt
2977'—#8 Parkway cable 3/c, 7200 volt
262'—#8 Parkway cable 3/c, 600 volt
1900'—#6 Parkway cable, 3/c, 7200 volt
970'—#2/0 Parkway cable, 600 volt
2,098'—#6 Tirex cable, 600 volt, 3/c
1417'—#4 Tirex cable, 3/c, 600 volt
547'—#2 Tirex cable, 3/c, 600 volt
1022'—#12 new Tirex cable, 4/c, 600 volt
5250#—300,000 CM stranded w.p. 1/c
14122'—#1/0 stranded r.c., 1/c
16682'—#4 stranded r.c., 1/c
2300'—#4/0 stranded r.c., 1/c
1705#—#4 solid bare
5467#—#2 solid bare
2600#—#1 solid bare
1255#—#1/0 solid bare
2975'—type TTHFA-60 new telephone cable

PIT CARS

160—60 cu. ft. coal mine cars, wooden sides, 42" ga.
125—60 cu. ft. Card steel coal mine cars, 36" ga.
88—66 cu. ft. Card steel coal mine cars, 36" ga.

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2—Joy Shuttle Cars, Model 42D5.

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500 KW G.E. 275 v. 720R MPC-ATI 2300
440 KW West. 550 v. 720R-Syn.-SK 2300/4000 v.
3—300 KW West. 275 v. 1200R-Syn. 2300 v.
300 KW G.E. 275 v. 1200R-MPC-ATI 2300/4000 v.
300 KW West. 275 v. 1200R-SK-CW 2300 v.
200 KW G.E. 275 v. 1200-MPC-ATI 2300/4000 v.
200 KW Ridg. 275 v. 900R-Syn. 2300 v.
200 KW West. 275 v. 1200 R SK-Syn. 2300/4000 v.
200 KW G.E. 125 v. 1200 R MPC-ATI 2300/4000 v.
150 KW G.E. 275 v. 1200 R. MPC-ATI 2300/4000 v.
100 KW G.E. 550 v. 900 vR-DLC-ATI 2300/4000 v.
100 KW Ridg. 275 v. 1200R-Syn. 2300 v.
35 KW G.E. 125 v. 1750 R. RC-KT 220/440 v.
15 KW Ideal 125 v. 1750R. D-A 220/440 v.

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20 ton Jeff 250 v. 44" Ga. MH77
15 ton Jeff 250 v. 38/40" Ga. MH110
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6/7 Ton Jeffrey Battery 42" ga.
6 ton Westgh. 250 v. 36" Ga. 904
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35 BB Jeff. A.C. Permissible

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14 BU-3PME Joy 250 volts
8BU-11E Joy 250 volts
2-8SC-5E Joy Shuttle Cars

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300 KW G.E. 275 v. HCC6-1200R, 2300/4000 v.
300 KW G.E. 275 V. HC12-600 R, 2200/4000
300 KW West 275 V. 1200R, 2300/4000 v.
200 KW G.E. 275 v. HCC6-1200R, 2200/4000 v.
Will rewind transformers to your specifications.

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HP	MAKE	SPEED	TYPE	WDG.
400	G.E.	450	IM	S.R.
300	G.E.	450	MT	S.R.
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2—100	G.E.	450	IM	S.R.
100	West.	900		Syn.
100	West.	1200	CS	S.C.
75	West.	900	CS	S.C.
50	G.E.	1750	KT	S.C.
50	G.E.	900	KT	S.C.
40	G.E.	900	M.T.	S.R.
30	G.E.	900	KT	S.C.
30	G.E.	1200	KT	S.C.
20	West.	1200	CS	S.C.
15	West.	1750	CS	S.C.

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SUPERIOR HEAVY DUTY DIESEL
510 HP at 360 RPM—5 cylinder—14½x18—type ZDSB—non-reversing—vertical—4 cycle—cold starting—mechanical injection. Engine totally enclosed. Complete with 48" 7 groove V-belt sheave and new spare parts. For heavy duty pumping, dredge service, power generation, textile and saw mills, mining, etc. Excellent condition. For immediate delivery.

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14" belt	$16.50	30" belt	$19.50
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18" belt	18.00	42" belt	21.00
24" belt	18.75	48" belt	21.75

1-roll Return Idlers for these sizes:

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Famous brands at deep cut prices. New; Fresh Stock

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30"	4	1/8"	1/32"	28 oz.	3.97/ft.
36"	4	1/8"	1/32"	28 oz.	4.70/ft.
48"	4	1/8"	1/32"	28 oz.	6.16/ft.

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All welded steel head and tail pulleys, and assemblies complete. Priced from $60.00

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*7½	Comp.	1200	700.00	225.00
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*This is a Marine type motor with shaft on both ends.

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1—500 KW West. Syn. 275 V 900 RPM
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3—200 KW G.E. Syn. 275 V 1200 RPM
These are 3 phase, 60 cycle, 2300/4000 V, complete with switchboards and full automatic AC and DC switchgear.

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1—1300 HP Nordberg
1— 900 HP Nordberg
1— 350 HP Vulcan
1— 350 HP Vulcan Double Drum
1—650 HP Ottumwa
3— 800 HP Vulcan
1— 500 HP Hardie-Tynes
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Complete specifications on the above Hoists, such as motor characteristics, rope speed, rope pull, size and amount of rope drums will spool, etc., furnished on request, together with our low prices.

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2—20 ton Jeffrey, MH-77
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2—15-ton West. 908-C
2—15-ton Goodman 36-A
5—15-ton Jeffrey MH-110
4— 8-ton G.E. HM-834 with reels
2— 6-ton Jeffrey MH-88, 29" ht.
15— 6-ton G.E. HM-835, 29" ht.
2—13-ton G.E. HM-829
4—13-ton G.E. HM-827
2—13-ton Jeffrey MH-110
4—10-ton Goodman 34-B
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Complete with new Jeffrey steel strip resistances. All have been rebuilt and any part showing any wear was replaced with new. Guaranteed 100 per cent against electrical and mechanical defects.

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1—5-Track Steel Tipple with Link-Belt No. 5035 Washer, 250-300 tons per hour capacity, complete with 4 large loading booms, shaker screens, vibrating screens, and all necessary appurtenances. Like new.
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These are complete with switchboards, switchgear, and single phase transformers for 2300 Volt.
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3—Jeffrey 29-U cat mounted
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100—tons 30# rail in excellent condition. All straight.
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Electric motors, both DC and AC.

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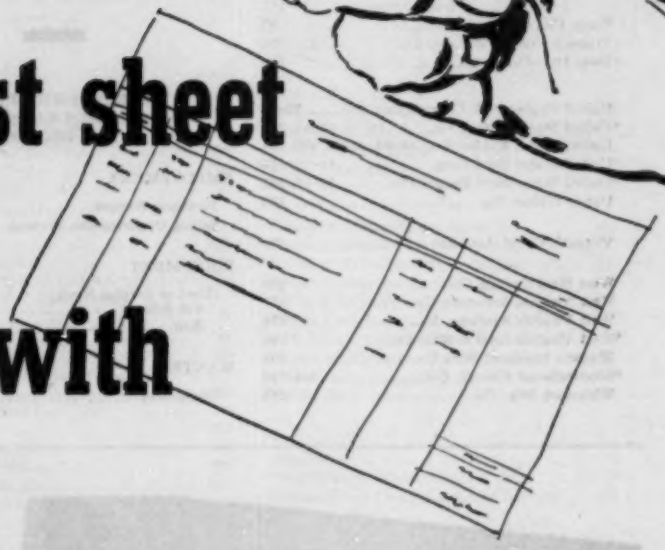

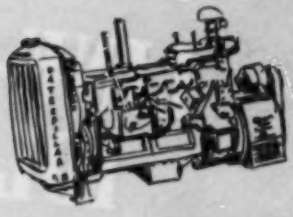

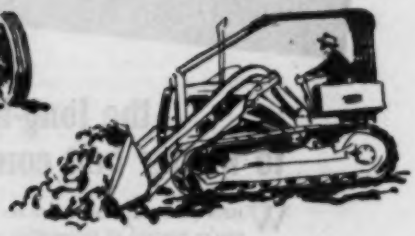

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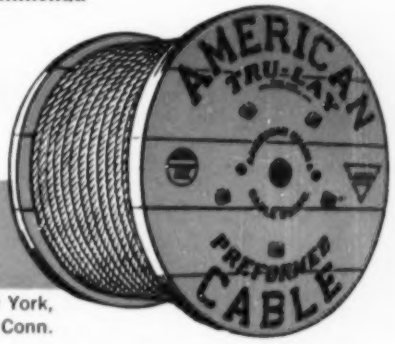

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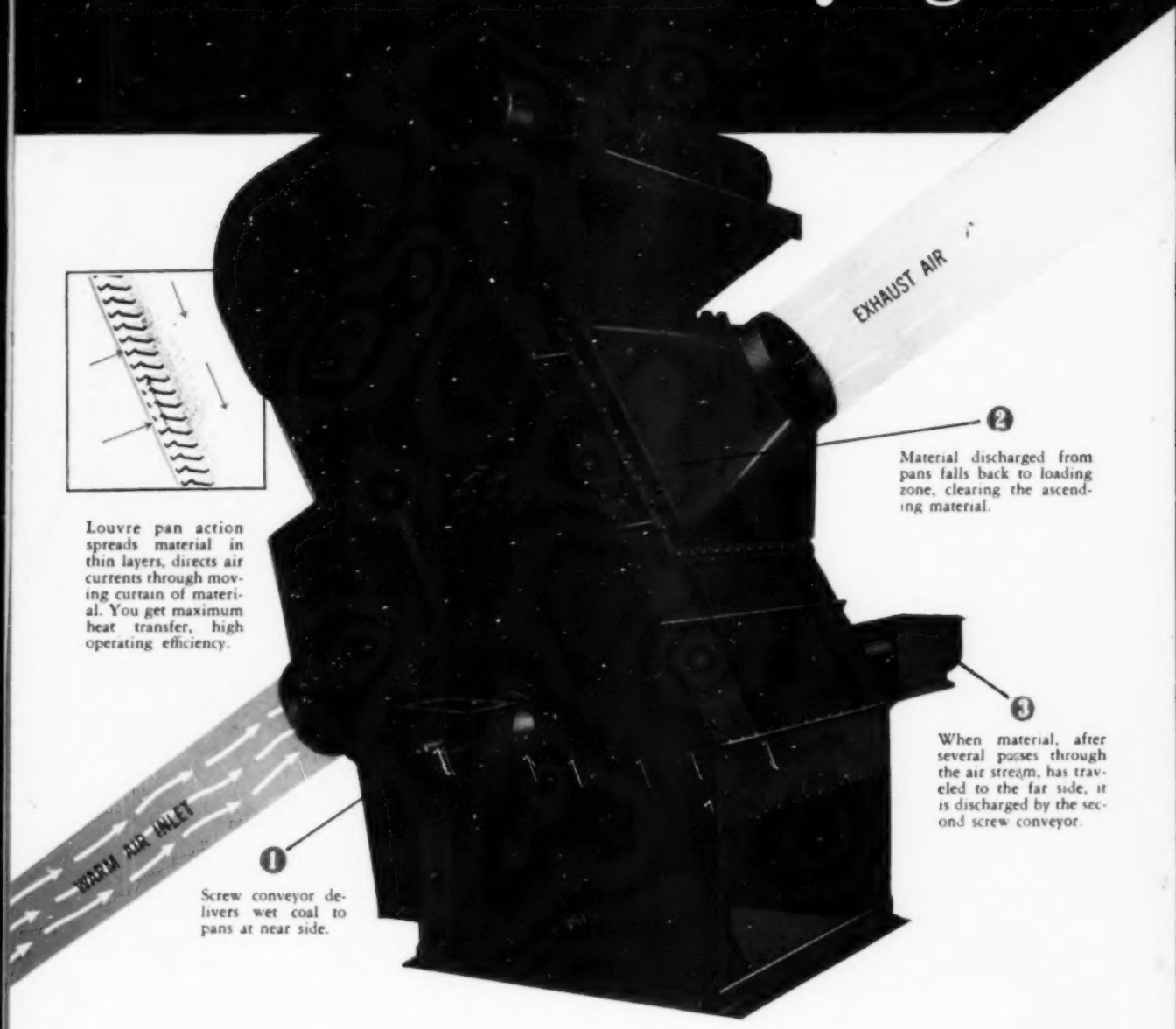
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2
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3
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1
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